IO. BAPTISTAE PORTAE NEAPOLITANI

ELEMENTORVM CVRVILINEORVM LIBRI TRES.

In quibus altera Geometriæ parte restituta, agitur de CIRCVLI QVADRATVRA.

Ad Illustrissimum Principem ac D.
D. FEDERICVM CAESIVM
MONTIS CAELII MARCHION. II. &c.
BARONEM ROMANVM.

ROMAE,
Apud Bartholomæum Zannettum. M. DC. X.

SVPERIORVM PERMISSV.

Imprimatur si videbitur R. P. M. Sac. Pal. Apost.
Cæsar Fidelis Vicesg.

Libri tres Elementorum Curuilineorum Perillustris & Excellentissimi D. Ioannis Baptistæ Portæ Neapolitani, ex ordine Reuerendissimi P. Magistri F. Ludouici Ystella Sacri Palatij Apostolici Magistri perlegi, eosque cum nihil fidei, vel moribus aduersum continere inuenerim typis dignos existimaui. Romæ Die 20. Iulij 1610.

Antonius Butius Fauentinus Ciuis Romanus Philosophiæ & Medicinæ Doctor.

Imprimatur. Fr. Damianus à Fonseca magister, & Socius Reuerendissimi P. Magistri Fr. Ludouici Ystella, sacri Palatij Apostolici Magistri, Ordinis Prædicatorum.

In Clarissimum ac Doctissimum Virum

IO. BAPTIST. PORTAM NEAP. LYN.

& in librum de Circuli Quadrato.

Ioannis Demisiani Cephalleniensis D. Philosophi ac Theologi.

ΗΜΟΣ ἑοῖς ἐπέεσσι πολύχροα Δαίδαλα ΠΟΡΤΗΣ
Φαίνει, τοῖς θαλέθει γαῖα πυκαζομένη.
Οὔατι θαμβαίνουσα βιαρκεῖ μῦθον ἀκούει,
Καὶ σφετέρης γαίης φθέγγεσιν ἀγλαΐης.
Αξυνέτου βάζοντος ἀπείριτα θαύματα πόντου,
Σιγαλέη πόντος νηνεμίη γελάα.
Ηέρος αἰγλήεντος ὅταν χύσιν αὐτῆς ἐνίσπει,
Ισον ἀπαστράπτει δώμασιν οὐρανίων.
Αἰθέρος ἀστροχίτωνος ἀτειρέα νῶτα πιφάσκει,
Καὶ Πόλος ἠρεμέων οὐδ᾽ ἐπέρασσε θέει.
Κύκλα δὲ, καὶ Τετράγωνα, Τρίγωνάτε, Πρίσματα, Κώνους,
Καὶ γραμμὰς μέτρει, κέντρατε πυραμίδων.
Οσατε πὰρ Νείλου προχοῇς μητίσατο τέχνῃ
Αἶια δαιτροσύνων Ηερίης ναέτης.
Αὐτήνικω Σοφίη πολυμήχανα δήνεα τίει,
Υδωρ πρηῢ ῥέον Νεῖλος ἐρυκακέει.
Εδρακε γὰρ Τετράγωνα πάρος πολεμήϊα Κύκλοις,
Ορκια συνθεσίης, καὶ φιλίης ταμέειν.
Εδρακε, καὶ θάμβησεν ὅπερ χρόνος ὀψὲ φαείνειν
Ημελλε, ζαθέων ἠΰ τέκος πραπίδων.
Αλλον ἐγὼ Κρονίδη δώσω πολυΐδμονα ΠΟΡΤΗΝ,
Ην ἡμῖν ἄλλων Παρθενόπη ὀπάσοις.

FRANCISCI STELLVTI
FABRIANENSIS.
LYNCÆI.

Vidimus innumeras mutantem Protea formas;
Credite, nam veri Nuncia Fama canit.
Tortilis en Orbis species se vertit in omnes,
Et QVADRVM teretes efficit arte rotas.
Dicite Pierides quo tandem munere factum?
Aut nostro, aut PORTÆ. visq. laborq. pares.

ILL.

ILL.MO PRINCIPI AC D. D.

FEDERICO CAESIO MONTIS CAELII MARCHIONI II.

Io. Baptista Porta Neapolitanus : S.

CERTAMVS inter nos, Illustrissime Vir, tu beneficijs, ego officijs; quibus ęquo animo vel vincar abs te, vel, si fieri posset, vincam te. Et sanè grauis ista contentio nullum vnquam finem habitura videtur. Summis me ornas laudibus, meos libellos plausu, nedum honore prosequeris, &, quod caput est, iacentes aliquando, ac mox improborum impetu proterendos, erigis & defendis; quæ quidem merita ita in memoria insederunt mea, vt mei ipsius potiùs, quam illorũ erga me magnitudinis obliuio capiat. Ego verò si titulos percensere velim, quibus tuũ animum virtus cohonestauit, splendorem domus, quam
„ Bellipotens illustrat Auus, Tu fulcis, & ornas.
aliaq; ornamenta, quibus te natura mirificè cumulauit; & vires, & vita me deficeret. quid? ipsam Inuidiam ad maxima quæque, ac pulcherrima labefactanda natam, virtute superasti.

„Est

„ Est aliquod meriti spatium, quod nulla furentis
„ Inuidiæ mensura capit. —

Sed non est animus in præsentia laudes enumerare tuas. maioris id molis est. leuiter, at amanter tetigisse satis; neque enim qui Cœlestium Orbium ornatum in parua describunt tabella, de illorum pulchritudine quicquam demunt; parua, vt ita dicam, sed concinna magnitudo. Quid igitur mirum si certos fines, terminosq. huic suauissimæ concertationi non constituo? Non patitur mea in te obseruantia Victoriam. Tu, quæ tua est magnanimitas, cedere nescis. Esto lis sub te Iudice. Tu te vince

„ Inq. animis hominum pompa meliore triumpha.

meum certè quidem tibi deuinxisti, ac deuicisti. Non excitabo testes ex monumentis, quæ in manus peruenerunt Sapientum. Sit hic liber tuo insignitus nomine, amoris, ac venerationis in te meæ pignus sempiternum. Circulum quadrare conatus rem scilicet aggressus in eruditorum identidem commemoratam comitijs, in Philosophorum agitatam scholis, in Mathematicorum iactatam iudicijs. Multos in hoc Theoremate me labores exantlasse, curas, & cogitationes euigilasse meas, ac pertinaci industria desudasse, non inficias iuerim. An verò modum quadrandi Circuli inuenerim, sicq. præmium, & fructuum meorum cœperim laborũ, non facile statuerim. Id saltem assecutus mihi videor. Latissimum aperuisse campum ad meliora vel inuestiganda, vel inuenienda. Verecundè tamen dixerim, plurima nos excogitasse, multa in disquisitionem vo-

casse, suisq. examinasse ponderibus, quæ nemo vsque in hodiernum diem odoratus quidem est. Immo, vt id quod sentio, aperiam, opus magnis viris tentatum, ac tandem desperatum, aut inchoauimus, aut perfecimus. nihil tamen in tanto, ac tali negocio pro certo affirmarim, te, non assentiente, tuæ enim Παλλάδος ὑπὸ πτεροῖς ὄντα ἅζονται βροτοί. tuo iudicio, ac patrocinio fultus, non morabor τοὺς γεφυριστάς. Tenes, opinor, memoria, incomparabilis vir, Ephesiorum factum. Illi dum hostili vexarentur bello, de rei euentu consuluerunt Oraculum. datum responsum, si Rempublicam sartam tectam cuperent, ad Tutelaris Numinis Templum Vrbē alligarent; quo peracto, hostes in fugam verterunt, Ephesumq. obsidione, ac metu liberarunt. Multi iam cogitant nostra obsidere inuenta, machinas admouent, ac penè labefactant: sed meus Apollo dudum me commonefecit, vt me meaq. tui Genij vinculis obstricta, aduersariorum impetus reprimam, ac frangam. Tuere igitur, Heros, litterarum, ac litteratorum Censor, quæ tibi dicata sunt, eo vultu, quo intuentium allicis animos. Habes à Philosophia non minora clementiæ, quam iudicij præsidia, vt illa nouos hosce foueas conatus, hoc vt defendas. Vale, tecumq. crescat tuæ Gentis spes, Patriæ columen, litterarum decus, meæ Neapoleos amores, Italiæ gloria. Kal. Iulij M.DC.X.

AD

AD LECTOREM PRAEFATIO.

NON immeritò, Candide Lector, admirari satis non possumus de viris quibusdam omni doctrinæ genere cumulatis, qui, cum mathematicas tractationes sibi assumpserint, atque in ijs cum laude versati, sint, de illa parte, quæ curuas complectitur lineas, nihil ferè commentati, aut meditati sint. In quadrando quidem certè Circulo (re scilicet æquè decantata, atque ardua) plerique ingeniosi viri desudarunt, & elaborarunt rectè ne, an secus, ipsi viderint. Ego qui noui aliquid moliri, non aliorum labores veluti fucus surripere studeo, eandem quidem subiui aleam. Sed vt legitimè & expeditius id præstarem, multa ex Euclideis elementis ad propositum argumentum transtuli, ac plurimas confeci demonstrationes, ex quibus, aliquas, quæ ad rem facere videntur seleg gi, easq. vti curuilinearum figurarum elementa proposui. Hinc ad perdifficile Theorema de quadrando Circulo, progressus sum. quid vero effecerim in re multis circunfusa tenebris, & in quà summorum virorum ingenia errare potius, quam hærere visa sunt, aliorum esto iudicium. si perfectionem non sum omnino assecutus, conatus certè, & adumbratio tanti Theorematis laudandus.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Primus.

DEFINITIONES.

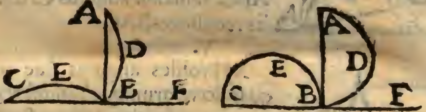
PRIMA.

LINEA curua eſt, quæ inter ſua nõ æquè fluit puncta, ſed facto ſinu flectitur.

II.

Angulus flexilineus eſt flexarum linearum retuſio ſuo nutu ſibi coincidentium.

III.

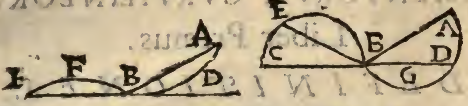


Angulus flexilineus rectus, qui rectilineo reſpondet.

Exempli cauſa ſit A.B.inſidens linea iacens FBC. vtrobiq. ſibi æquales conſtituens angulos ABF, ABC. ſitq. AB. ipſi B. C. æqualis & ipſi AB.hemicyclium circumſcribatur ADB.vel circuli portio, & ipſi BC. alter B. E C. vel æqualis circuli portio. Cyclogoni ergo DBA. CBE. ſunt æquales, & quanto angulus AD.B.F. maior eſt recto ipſo contingentiæ angulo DBF. tanto ABE. ſuperat ipſum ABC. altero contingentiæ angulo ABE.

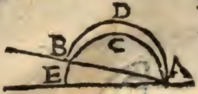
totus igitur A D B E C. toti ABC. recto æqualis, vt probauit Proclus in Eucl.

IIII.



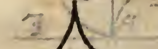
Obtusus curuilineus, qui obtuso rectilineo fit quando à recto resupinata in maiorem angulum abit.

Eodemq. modo angulũ ADB. FE. flexilineum, rectilineo ABE, esse æquale flexilineus angulus FBE. est æqualis flexilineo DBG. nàm æquales sunt circulorum portiones, si angulum DBG. abstuleris, & reposueris supra EB. erit rectilineus DBE. æqualis flexilineo D.G.B.F.E.



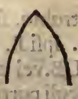
Sic etiã semicirculus ADB. æqualis est A C E, dematur portio communis ABC. remanet angulus CAD. æqualis rectilineo BAE.

V.



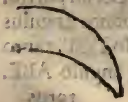
Xystroides angulus siue concauus quando vtrarumq. circumferentiarum caua extra fuerint, & intus se respiciens conuexitatibus suis.

VI.



Contra conuexus angulus quando circumferentiarum conuexa vtrinq. extra fuerint, & inter se suis finibus aspexerint.

VII.



Angulus μηνοειδὴς. siue lunaris, qui ex caua conuexavè circumferentia fuerit, vt conuexum vnius alterius conuexitatem aspiciat.

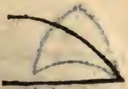
Cys-

VIII.

Cyſsoides Angulus ex hederæ folijs nomen indeptum ex gibboſis, cauiſq. lineis conſtat ad punctum vnum conuenientibus, vndatim contra ſe diſcurrentibus veluti Vndulatus.

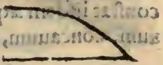
IX.

Mixtus angulus, qui ex rectis circuloſiſq. lineis componitur.



X.

Cyclogonus, qui à Caua, & recta circuli circumferentia conſtat.



XI.

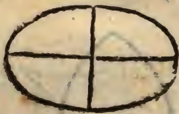
Κερατοειδὴς. ſiue in cornua falcatus, quando rectæ opponitur conuexa noſtri contingentiæ vocant.

XII.

Figura vel anguloſa, vel agonia, agoniarum figurarum circulus princeps, lineæ partem, quæ ambitioſè circumuoluitur, & aream obambit concauum dicimus, quæ extorſum inuehitur conuexum.

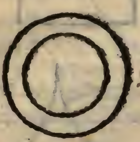
XIII.

Sphærois ſiue Ellipſis ex ambienti linea in ſe recurſa deſcribitur vnius duæ diametri, longitudinis vna longior, latitudinis altera ad rectum in medio ſe ſecantes.



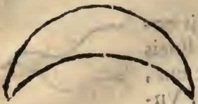
XIIII.

Vertex. ſiue corona eſt duorum circulorum concentricorum circumcurſus.



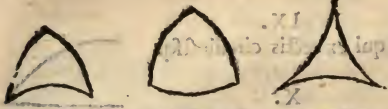
XV.

Anguloſarum figurarum metriſcus ſiue



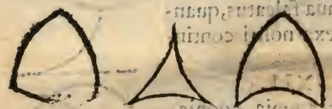
lunula prior, estq. in easdem partes caua habentibus comprehensa circumferentijs figura.

XVI.



Trilateratum figurarum flexilinearum triangulum primum est, quod tribus constat ijsdem æqualibus circumferentijs circuli, idq. conuexum, concauum, vel mixtum.

XVII.

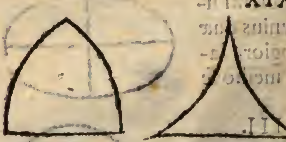


Isoscele triangulum curuilineum, quod duabus tãtum æqualibus circuli circumferentijs continetur, idq. etiam conuexum, vel concauum, vel mixtum.

XVIII.

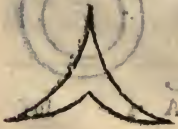
Scalenum flexilineum est, quod tribus inæqualibus circuli circumferentijs clauditur, ijsq. cauis conuexis, & mixtis.

XIX.



Semicuruilinea triangula sunt, quæ ex rectis, curuisq. circumferentijs continentur.

XX.

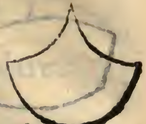


Tricuspidatum triangulum, siue acio idea quadrilaterum est triangulum quod tres habet acutos angulos.

Inter

XXI.

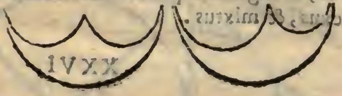
Inter triangulares figuras πελεκοειδής. Figura est, quæ securis vel bipennis formã habet.



Eius Theocritus meminit. Nicandri Scholiastes sutorium scalprum. Τὰ κυκλοτερῆ σιδήρια, οἷς οἱ σκυτοτόμοι τέμνουσι καὶ ξύουσι τὰ δέρματα. Ideſt circularia ferramenta quibus pelles incidunt, & deradunt.

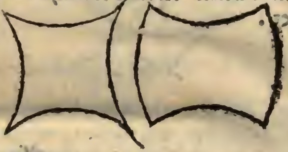
XXII.

Arbilones ex tribus circumferentijs compræhensi; Horum meminit Pappus ſpatium illud inter circumferentias interiectum ἄρβηλον vocans.

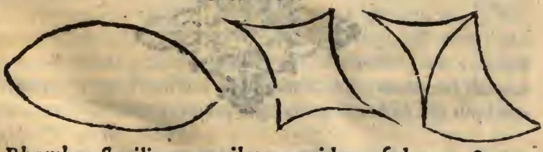


XXIII.

Quadrilaterarum quidum figurarum curuilinearum quadratum quidem flexilineũ eſt, quod rectis angulis, & æqualibus circumferentijs perſcribetur.



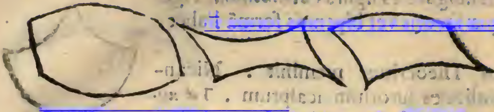
XXIIII.



Rhombus flexilinea æquilatera quidem, ſed non rectangula, aduerſos tamen angulos æquales habet, eorumq. aliquos concauos, conuexos, & mixtos.

Rhom-

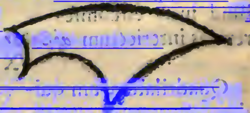
XXV.



Rhomboides vero neutrum horum habet neque laterum, neque angulorum æqualitatem, sed contrarias circumferentias, & angulos æquales habet similiter etiam concauus, conuexus, & mixtus.

XXVI.

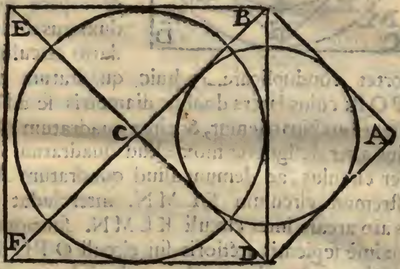
Trapezoides curuilineum, quod quatuor inæqualia latera ex diuersis circumferentijs habet.



PROBL. I. PROP. I.

Datum circulum duplare.

SIT datus circulus ABCD. cuius oportet duplum inuestigare. Describatur quadratum per 7. 4. Eucl. & sit ABCD. ducto Diagonio BD. secundum datum BD. describatur quadratum per 48. 1. Euclidis, & sit BEDF. cui circulus inscribatur per 6.4. dico circulũ BDFE. esse dati duplum. Hanc



constructionem demonstratione fulciendam rati sumus. quoniam BCD. rectus est angulus proinde cum quadrata lateris BC. CD. æqualia sint quadrato ex BD. ex 47. 1. ergo quadratum ex BD. duplum quadrati ABCD. sed ex BD. descriptum quadratum est DBFE, ergo quadratum BDEF. duplum ipsius ABCD. sed circulus ad circulum eandem rationem habet, quam quadratum inscriptum, aut circumscriptum, vt ex Euclidea demonstratione ratum est duodecimi elementorum secunda, ergo circulum ABCD. duplauimus per circulum BEFD.

Plato ita quadratum duplat vt à Vitruuio annotatur. Dimidium quadrati BDC. est quarta pars quadrati BEF. ergo quadratum BEDF. duplum est ABCD.

Possu-

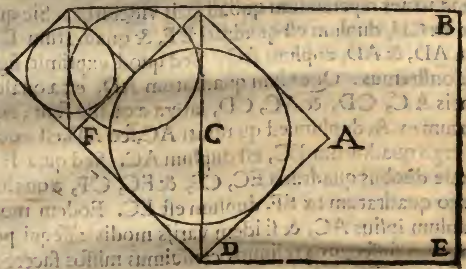
Possumus, & alio modo circulos duplare, si circa datum circulum quadratum induxeris, & post circa quadratum circulum, & circa circulum aliud quadratum eodem modo alios circulos semper duplicabis. Sed quo iuuenes rectius imaginari, & capere possint exemplo duximus declarandum. Esto datus circulus STVX. quem oportet conduplicare, huic quadratum circumstruemus O P Q R. cuius latera duabus diametris se ad centrum I, decussantibus bipartiemur, & circa quadratum O P Q R. circulus alter designetur mox aliud quadratum. K. L. M. N. & alter circulus, ac demum aliud quadratum A B C D. quod postremum circulum K L M N. intercludat. His perstructis aio aream inter circuli K L M N. finitionem concludam proximè sepientis arctioris sui circuli O P Q R. duplam esse, vt laxior postremi area eius, qui minimum intercludit quadrupla sit, & sic in infinitum duplare possumus cuius veritas hac demonstratione repræsentabitur. Quoniam linea A B. bifariam diuisa est in E, quadratum A B C D. quadruplum est ipsius A E, & sic in quatuor quadrata æqualia A I, E G, F H, I D. & hæc à quatuor diagonijs bifariam diuisa sunt E F, F H, H G, G E, quatuor igitur triangula extrinseca F A E, E B G, G D H, H C F. quatuor interioribus æqualia sunt; ergo totum quadratum A B C D. quadrati E. F. G. H. duplum erit, eademq. ratione quadratum E F H G. ipsius O. P. Q. R. duplum erit, & primum A. B. C. D. huius quadruplum.

Anni-

Annitemur etiam per quadrata dupla ambientia idem rimari, & absoluere. Esto datus circulus A B C D, cui quadratum ABCD. circumstruimus: mox ab oppositis angulis ducto diagonio AD & à puncto C, superne versus A, signa lineam eiusdem longitudinis ipsius AD,& sit C E, & ex parte inferiori sit C F, mox trahe diagonium E F; & iterum quanta E F, figura in linea C G, & inferne linea CH, & id toties repetendum quoad satis videbitur. Sic quadratum ex GH, duplum est quadrati E F, & quadratum E F, duplum AD, & AD, duplum AC. Sed quod exprimit figura, demonstremus. Quoniam quadratum AD, est æquale quadratis A C, C D, & AC, CD, latera æqualia sunt, ergo quadratum ex A, duplum est quadrati AC,sed AD,est æquale EC, ergo quadratum EC, est duplum AC. Sed quia E F, est æquale duobus quadratis EC, CF, & EC, C F, æqualia sunt, ergo quadratum ex EF, duplum est EC. Eodem modo GH, duplum ipsius AC, & si idem varijs modis assequi posset, tanquam suffecturos reliquos censuimus missos facere.

Libet non prætermittere, alium quadruplandi modū. Sic circulus B C, quem intendimus quadruplare circa quem æquilaterumtriangulum per tertiam quarti describamus, & circa illud alium circulum per quintam eiusdem quem quadruplum pronunciamus. Quoniam DG,tripla est ipsius GA. ex

12. 13. si quadratum D G, erit duodecim partium talium GA, erit 4. & quadratum G B, erit talium 3. nam quadratum G D, quadruplum est G B, suæ dimidiæ, sed quadratum AG, est æquale quadratis GB, BA, igitur si quadratum G A, erit talium 4. & quadratum GB, talium 3. erit quadratum B A. talium I, sed A E, erit quatuor, quoniam est æqualis A G. & quando quadratum totum 4. est, & sui pars 1. erit linea per medium diuisa ergo AB. ipsius AE. dimidium erit, ergo tota AD. ipsius EB. quadrupla est. Si vero circulum diuidere voluerimus, poterimus conuersa vti operatione; Et si facilia quidem sint, quo tyrones iuuemus alium modum apponere non pigebit.



Describe quadratum tantæ quantitatis quantæ duplarem circulum diuidēdum fieri cupis, & sit ABCDE. cuius medio fige punctum A. super quo ambitiosa linea circumducatur, quæ omnia quadrati tangat latera, deinde annecte literas rectas à centro ad angulos duos AC. CD. & constitue triangulum ACD. & aliud priori par triangulum constitue cuius angulus F. erit rectus est igitur ACDF. secundum quadratum primi dimidium. In medio puncto huius diagonij CD, qui sit G. pone pedem circini, & reliquo vago describe circumferentiam tangentem sui latera quadrati ACDF. & hoc mo-

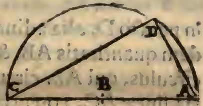
do

do in infinitum poteris circulos dimidiare. Demonstratio ex superiori pendet.

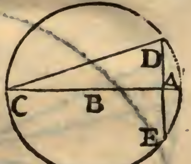
Datum circulum triplicem quintuplicem, & septuplicem reddere.

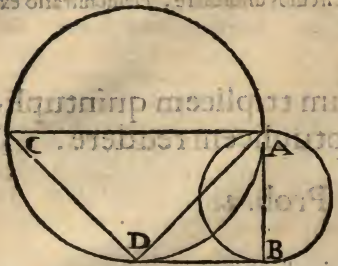
Prob. 2.

SIT dati circuli diameter AB. quem volumus triplare elongetur AB. in C. & sit AB. æqualis BC. & fiat circulus ex diametro AC. & sit AB. æqualis AD. quæ in circulo locetur per primam 4. Euclid. & ducatur DC. dico circulum ex DC. diametro circuli ex AB. tripli esse cuius demonstratio ex 12. 13. lib. Eucl. pend.

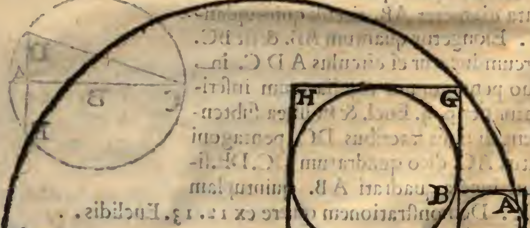


Si vero quintuplare voluerimus sit data diameter AB. circuli quintuplandi. Elongetur quantum AB. & sit BC. circumducatur ei circulus ADC. in quo pentagonum æquilaterum inscribatur per 9. 4. Eucl. & sit linea subtendens duobus lateribus DC. pentagoni latus AC. dico quadratum DC. DE. simul iuncta quadrati AB. quintuplam esse. Demonstrationem quære ex 12. 13. Euclidis.





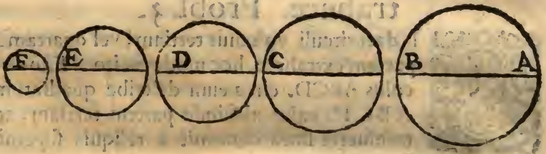
At is modus, vniuersalior, & commodior visus. Sit datus circulus A B. dimetiente descriptus, volo tergeminum reddere. Puncto igitur B. ipsius lineæ A B. ad rectos angulos adiungatur D B. paris quantitatis. Mox trahatur AD. dein ipsius lineæ DA. in puncto D. alia adiungatur DC. ad rectos angulos, & eiusdem quantitatis AB, & ducatur CA, & dimetiente CA. fiat circulus, qui AB. circuli tergeminus erit. Quoniam potentia lineæ AC, potentia linearum AD. DC. sibi vendicat, & AD. ipsas AB. BD. igitur AC. valet tres circulos, cuius inest A B. Quod si quintuplare, aut per alios impares numeros multiplicem reddere voluerimus: Addemus puncto C. lineam alteram ad pares angulos quantitatis AB. & erit quintupla ipsius AB.

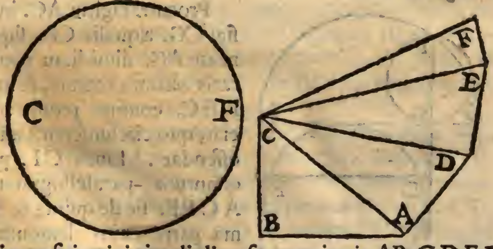


Possumus etiam si velimus alio modo idem exquirere.

Sta-

Statuatur circulus A B C D. ſepties multiplicandus cui circumducatur quadratum, & latus eius producemus, illudque in octo partes diuidemus, cuius principium D. finis E. mox DE. per medium diuidatur in F. poſitoq. circini pede in F. & alio DF. circumducatur quouſq. ſemicirculum abſoluat DE. & latus C. B. quadrati producatur vltra B. in continuum, rectumq. ad arcum DE, & vbi eum contingit, illic ſcribe literam G. & ex CG. fiat quadratum CGHE. in quo circulus inſcribatur, qui continebit ſepties ipſum BACD. Quoniam CG. eſt media proportionalis inter EC. CD. igitur per 13. 6. Euclid. vt EC. prima ad tertiam CD. ita GH. quadratum ſecundæ ad BD. quadratum tertiæ per 20. 6. Eſt autem E C. per conſtructionem ſeptupla ipſius C D. igitur quadratum HC: ſeptuplum ipſius quadrati BD. quod probandum aſſumpſimus.



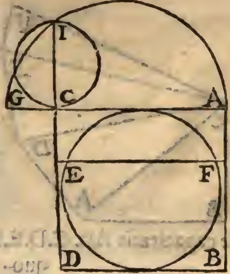


Sint poſiti quini circuli diuerſæ capacitatis AB. C.D.E.F. quo-

quorum quantitates volumus singulari circulo compræhendere, quod ita propemodum faciendum existimamus. Esto enim circuli diameter AB. constituatur ad rectos angulos ei BC. mox ducatur linea ab A. ad C. & hæc dimetiens potest binos circulos AB. C. Porrò puncto A. lineæ AC. recta linea erigatur ad rectos angulos, quæ sit AD. & à puncto D. trahatur linea D.C. & hæc dimetiens est capiens tres circulos AB. C. D. ipsi demum CD. recta linea ad rectos erigatur DE. quarti circuli dimetiens potens quatuor circulos. Postremo ei lineæ EC. ad rectos iterum excitetur quinti circuli EF. trahaturq. per FC. dimetiẽs, capiẽs iam cunctos circulos,& hoc modo omnes licet quotquot volueris compræhendere, Demonstratio habetur ex penultima 1. libri Euclidis.

Ex dato circulo datam partem subtrahere. Probl. 3.

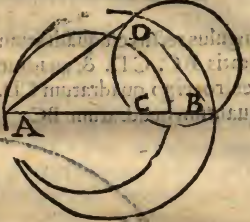
Si dati circuli volumus tertiam, vel quartam partem extrahere, hoc modo facito. Esto circulus ABCD. circa eum describe quadratum ABCD. cuius abscinde partem tertiam, ac transuersa linea conuenit à reliquis supernè distinguere FE.



Procurrat igitur AC. in G. & fiat CG. æqualis CE. supra lineam AG. dimidium rotunditatis arcum excurrat, & linea DEC. eousque producenda erit, quo circumferentiam in I offendat. Linea C I. potest quantum paralellogrammum ACFE. sic de quinta & septima parte cuius demonstratio ex vltima secũdi depẽdet Eucl.

Datis

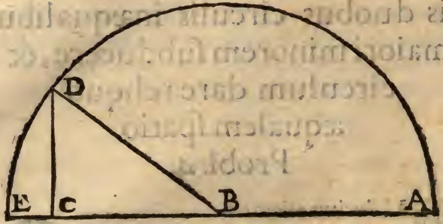
Datis duobus circulis inæqualibus à maiori minorem ſubducere, & circulum dare reliquo æqualem ſpatio.
Probl. 4.



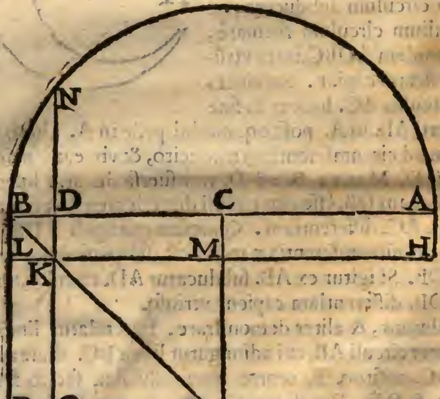
SVbducitur etiam circulus minor à maiori, & circulus etiã formari poteſt, qui vtriuſque diferentiam capiat. Eſto maior circulus ABD. volo ab eo circulum ſubducere, ac mox alium circulum formare, qui lunulam ADBC. inter vtrũque relictam capiat. Subducẽdus circulus AC. hæreat in fine diametri AB. in A. poſitoq. circini pede in A. altero ad C. vagum ad circumferentiam traducito, & vbi eam incidit, ibi locetur D. Mox ex B. ad D. tranſuerſa ducatur linea DB. Dico lineam DB. eſſe eius circuli dimetientem capientem inter AB. AC. differentiam. Quoniam trianguli ADB. angulus D. ad circumferentiam rectus eſt, ſubtenſa AB. poteſt, vt AD. DB. Si igitur ex AB. ſubducatur AD. circulus, remanet alter DB. differentiam capiens vtriuſq.

Poſſumus, & aliter demonſtrare. Extendatur linea AB. diameter circuli AB, cui adiungatur linea BC. diameter circuli AC. poſitoq. B. centro interuallo AB. facito ſemicirculum ADE. Tum ſupra C. erigo perpendicularem CD. quouſq. tangatur circumferentia in puncto D. & connecto BD. Dico CD. eſſe queſiti circuli diametrum. Quoniam C.

angu-



angulus rectus est quadratum subtensæ BD. æquale est quadratis BC. CD. & quadratum BD. est æquale AB. quia ex centro, ergo quadratum CD. tanto minus est quadrato BD. quantum quadratum BC.



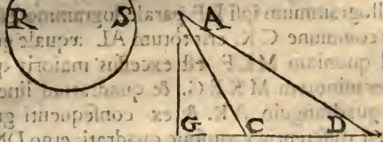
Quod si voles alio modo efficere hac ratione assequeris. Sit

Sit dimetiens maioris circuli CB. & ab ea amputetur dimetiens minoris circuli CD, & linea B C tantundem extendatur ad A, & puncto C facto centro circumducatur semicirculus ANB.& à puncto D,vbi minor dimetiens maiorē abscindit, erige super transuersam AB ad rectos angulos DN. & vbi DN periferiam secat ANB. istic pone N.& hæc linea erit dimetiens circuli inueniendi,qui differentiam capiat inter maiorem,& minorem circulum . Ex linea BC. describatur quadratum per 46. p.E. & sit CEBF. ducaturq. diagonium B E. & per D punctum descendat paralellas ipsi BF. sitq. DG. secabitq. diagonium in K & per K signum excitetur alter paralellus ad AB, & sit HMKL. & ex A ad H ducatur alter paralellus ipsi C M. Quoniam supplementum CK. supplemento KF. per 43. 1. est æquale, addatur commune quadratum D L. erit CL æquale D F. sed quia AM est æquale MB paralellogrammo, quia A C. & B C. sunt æquales, ergo AM paralellogrammum ipsi DF paralellogrammo est æquale, addatur commune C K. erit totum AL æquale gnomoni MLF. sed quoniam MLF est excessus maioris quadrati CBEF. super minorem M K E G. & quadratum lineæ D N est æquale quadrangulo A K. & ex consequenti gnomoni MBF quæ est differentia vtriusque quadrati; ergo DN circulus est differentia duorum inæqualium circulorum , quæ erat demonstrandum .

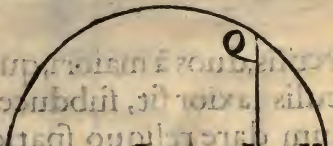
Datis tribus circulis,duos à maiori, qui duobus circulis laxior sit, subducere, & circulum dare reliquo spatio æqualem. Probl. 5.

SIT amplius qualem quis conficere velit circulus ADEF. sintq. pro arbitrio bini circuli A B. C D. quorum areæ

totam non contineant continentis amplitudinem, & ij vel in se ipsos flexi, vel mutuo intercisi, vt in exemplo; volo constringi circulũ, qui reliquum spatium contineat, scilicet interceptum vacuum. Ex tribus AD. DC. BA. fiat triangulum A C D. quod obtusum erit producaturq. alterutrius maioris circulatus, videlicet DC. eousque sit productionis meta, quousque à trianguli supercilio; quod prædictæ lineæ incumbit, linea



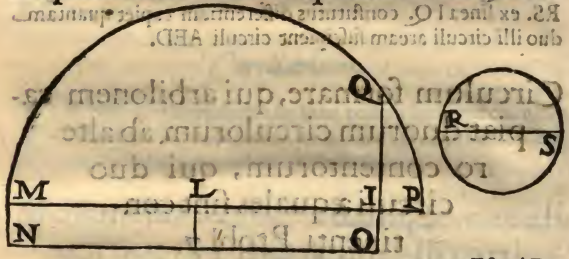
ad perpendiculum descendat, sitq. A G. His perfectis extruatur paralellogrã-mum, cuius productus latus sit ex CD. geminata, & sit ML. L I. breuius ex C G. sitq. MN. IO. & producatur MI. donec æquetur IO. & sit IH. & extremæ lineæ ora terminentur per

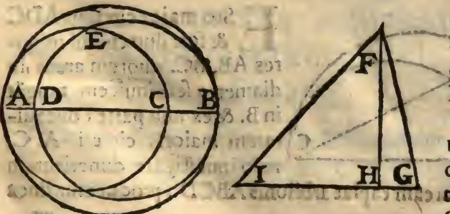


circuitionis arcum M Q H. elongeturq. O I. inferaturque coeun-

coeunti lineæ cum arcu litera Q. sic ex linea I Q. fiat circulus R S. capiens iam dictam differentiam. Quoniam angulus ACD. est obtusus, quadratum lineæ AD maioris circuli superat quadrata DC, CA, minorum circulorum per rectangulum compræhensum ex D C. & C G. bis per 12. 2. Euclid. & ex his constitutum rectangulum M I, & diameter Q I. capiet compræhensam aream, ex qua circulus RS. quæsitam differentiam continebit.

Datis tribus circulis duos à maiori, qui duobus circulis angustior sit, subducere, & circulum dare reliquo spatio deficienti æqualem. Probl. 6.





Esto AEB. circulus, qui capiet duos circulos AC BD. quorũ vterq. cõcauitate arcus capiẽtis cõtigat, fuisq.

 ar-

arcis continentis areā excellant, veſtigandus eſt circulus, qui differentiam excellentis areæ excipiat. Fiat triangulum ex tribus lineis AB. AC. DB. per 22. 1. Euclid. & ſit G F I. qui erit acutus, cadat ex apice F. trianguli in ſubſtratam baſem GI. orthogonaliter linea FH. & vbi eam abſcindit, illic fige literam H. Porrò ex geminata baſe GI. & linea GH in ſe ductis, fiat paralellogrammum MO. & ſuperior linea MI procurrat quouſque ſit æqualis IO. & ſit P. Mox partire interuallum MP. per æqualia in D. & ex D centro deſcribe ſemicirculum, elongeturq. linea IQ. quouſq. attingat arcum MP. in Q. & IQ dimetiens erit futuri circuli quæſitam differentiam capientis. Quoniam quadratum FI. minus eſt FG. GI. quadratis tantum, quantum rectangulum bis ſumptum ex linea IG. GH. per 13. 2. Euclid. quod erit NI. & linea IQ. erit dimetiens continens aream NI. circulus igitur RS. ex linea IQ. conſtitutus differentiam capiet quantam duo illi circuli aream ſuſcipient circuli AED.

Circulum formare, qui arbilonem capiat duorum circulorum ab altero contentorum, qui duo circuli æquales ſint continenti. Probl. 7.

ESto maior circulus ADC & ſint duo circuli minores AB. BC. quorum arcus in diametro ſeſe inuicem tangāt in B. & ex alia parte concauitatem maioris circuli A. C. volo inueſtigare dimetientem circuli, qui aream capiat arbilonis ABCD. producatur linea

ex

ex mutuo circulorum contactu B. donec rotundationis maioris circuli aream tetigerit BD. dico eam esse diametrum futuri circuli, qui arbilonis ABCD. aream continet. Hanc constructionem præsenti demonstratione suffulciemus. Quoniam linea AC. secta est in puncto B. quadratum, quod fit ex A C. æquale est quadratis, quæ fiunt ex AB. BC. & paralellogrammo, quod bis fit ex CB. BA. ex imperio 4. 2. Euclid. Sed paralellogrammum ex CB. BA. est æquale quadrato DB. circulus ergo ex DB. est æquale arbiloni ABCD. quod quadratum ex DB. æquale sit quadratis AB. BC. patet etiam ex 17. 6. Euclid. Vel quoniam circulus ex D C. æqualis est duobus circulis ex DB. BC. quia B. est angulus rectus, & circulus ex D A. circulis ex AB. B D. ergo circulus ex AC est æqualis duobus circulis A B. B C. & duobus circulis ex DB. qui in eo continentur, arbilon igitur ADCB. ex circulo D B. constat.

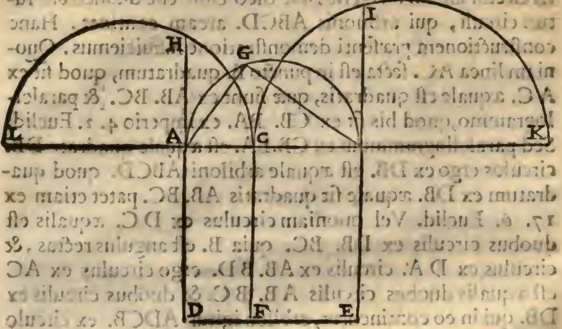
Corollarium.

Ex hoc prouenit dato arbilone posse illico dari circulum ei æquale, scilicet lineam erigendo ad duorum semicirculorum coniunctione ad circumferentiam.

Si diameter secetur vtcunque, circuli, qui fiunt ex tota, & singulis partibus continentur, æquales sunt ei, qui à tota fit circulo.

Probl. 8.

Fiat quadratum ex linea AB. & extendatur AB vsque ad K. & sit æqualis AB. & supra CK fiat circulus C I K. & ex alia parte BA extendatur in L, & sit æqualis AB. & super

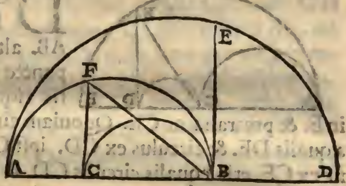


per CL. formetur circulus, & ſit CHL. & ſupra AB fiat alter circulus AGB. & ex C extendatur paralellus ipſi AD. BE. & ſit FCG. extendaturq. DA ad H. & EB ad I. ducanturq. ex G. GA. GB. Quoniam quadrangulum ex KB. BC. eſt æquale quadrato BI. & quadrangulum ex LA. AC. eſt æquale quadrato AH. coheant ipſæ BI. AH. in circumferentia AGB. in puncto G. quia in circumferentia ad rectum angulum: ergo quadratum ex AB. duobus quadratis AG. GB. æquale erit, & ſic de circulis, vel aliter.

Quoniam per præcedentem diameter diuiſa bifariam in C. quadratum ex AC. & CB. & rectangulum bis contentum ex BA. AC. eſt æquale quadrato AB. ſed rectangulum bis contentum ex BA. AC. eſt æquale quadrato ex CG. ſed quadratum ex BC. CG. & quadratum ex AC. CG. ſunt æqualia quadratis ex AG. GB. & quadratam ex AG. GB. ſunt æqualia quadrato ex AB. ergo oſtendimus, quod intendebamus, & eſt ſecunda ſecundi Euclid.

Si diameter ſecetur vtrunq; circulus ex tota, & eius parte contentus æqualis erit circulo, qui ex partibus continetur, & eius quod ex prædicta parte fit circulus. Propoſ. 9.

SIt diameter AB. ſecta vtcunq; in puncto C. dico circulum ex AB. BC. contentum æqualem eſſe circulo ex B C. C A. contento, & circulo CB.

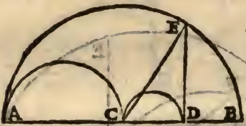


Extendatur AB. in D. & ſit BD. æqualis ipſi BC. & ſuper ACBD. fiat circulus, & ſit AED. & ex puncto B. eleuetur perpendicularis vſque ad E. Idem fiat ex altera parte. Supra AC. & CB. duo circuli, & aſcendat ex C perpendicularis CF vſque ad ſemicirculum AFG, extendaturq. FB.

Quoniam quadrangulum, quod fit ex AB. BD. æquale eſt quadrato, quod fit ex BE. & quadrangulum, quod fit ex BA. AC. æquale quadrato ex CF. ſed quadratum ex FG. æquale eſt quadratis FC, CB. quia C angulus eſt rectus ergo circulus ex AB. BC. quod eſt BF æquale eſt circulis ex CB. & qui fit ex BC. CA. & eſt 3. 2. Euclid.

Si

Si diameter secta fuerit in partes æquales,& inæquales circulus ex inæqualibus partibus contentus vna cum eo,qui fit ex linea, quæ inter sectiones interijcitur æqualis est circulo, qui fit à dimidia. Prop. 10.

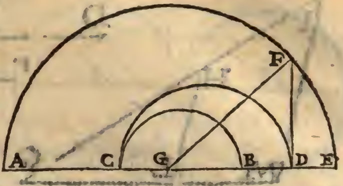


DEscribatur circulus ex Diametro CA. alter ex AB. alter vero ex CD. ex D. puncto erigatur perpendicularis vsque ad circumferentiam in E. & protrahatur CE. Quoniam circulus ex AD. DB. est æqualis DE. & circulus ex CD. ipsi CD. ergo circulus, qui fit ex CE. erit æqualis circulis CD. DE. sed CE. est æqualis CA. quia ex centro ad circumferentiam, ergo circulus ex duabus inæqualibus partibus compositus AD. DB. qui est DE. & circulus CD. vtrique æqualis est circulus ex dimidia CA. compositus, & est 5. 2. Euclid.

Si diameter bifariam secetur,eiq. in rectum adijciatur quædam recta linea, circulus ex tota diametro cum adiecta tanquam ex vno diametro,vna cum circulo dimidiæ æquales sunt circulo ex dimidia, & adiecta tanquam ex vna diametro descripto. Prop. 11.

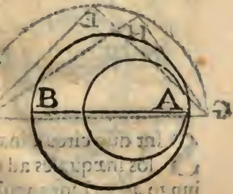
SIt diameter AB. secetur bifariam in C. & ei in longum adijciatur linea BD. dico circulus descriptus ex AD. DB. vna

DB. vna cum circulo CB. æquales esse circulo,qui fit ex CD.

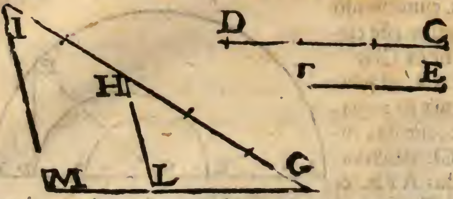


Lineæ AD. adijciatur DE, quæ sit æqualis DB, & centro G interuallo GE describatur circulus AFE. & ex puncto D linea ad rectum erigatur vsque donec circuli circumferentiam contingat, & sit DF. & erit quadratum quadranguli AD. DE. & puncto D, linea DG secetur CB æqualis, & erit GD. & connectantur puncta GF. linea GD est æqualis CB. ex constructione. Quoniam linea AC. est æqualis lineæ CB. & CB ipsi GD; adijciatur ipsi AC. communis CG. & linea DE. est æqualis BD. ex constructione, ergo CD. ipsi GE. & angulus ad D. rectus est, valet ergo quadratum GF. quadrata GD. DF. ergo quadratum GF. valet quadratum CD. quod demonstrandum proposueramus, & est 6. 2. Euclid.

A dato circulo alium in datam proportionem abscindere. Prop. 12.

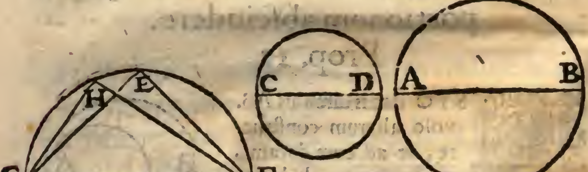


ESTO datus circulus AB. volo alterum construere, vt ad eum datam proportionem habeat, sitq. data proportio CD. ad EF. scilicet sesquialtera, Iungantur angulo binæ lineæ, quarum vna GH. sit æqualis lineæ CD. protendanturq. quousque HI sit æqualis EF. Mox alteri lineæ æquetur dia-

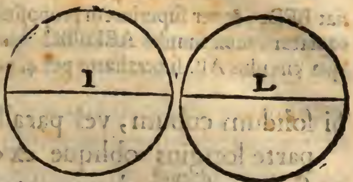


meter AB. quæ sit GL. iungaturq. HL. & GL. extendatur, & à puncto I. lineæ H L. paralellus excitetur I M. dico LM. diametrum esse quesiti circuli A O. subsequialteri, & erit quarta linea proportionalis inuenta. Quoniam proportio GH. ad HI. est sicut GL. ad LM. ex 12. 6. Eucl. & GH. ad HI. est sesquialtera, ergo GL. diameter ad AO. diametrum sesquialtera est.

Ex duobus inæqualibus circulis duos æquales facere. Prop. 13.

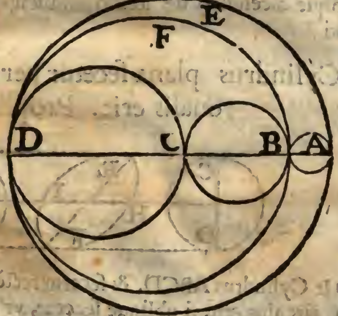


Sint duo circuli inæquales AB. CD. volo hos duos circulos inæquales ad duos æquales reducere AB. DC. coniungo ad rectum angulum diametros, & sint GHF. & connecto GF. tunc super FG. facio semicirculum, qui per H rectum angulum trāsibit, mox diuido circumferentiā in E. bifariam, & pro-



produc o GE.EF.dico duos circulos duarum dimetientium GE, EF. eſſe æquales duobus dimetientibus GH, HF. & proinde circulis I, L. Quoniam angulus H eſt rectus, quia ad circumferentiam, ergo quadrata GH. HF. ſunt æqualia quadrato GF. & quadratis GE, EF. etiam æqualia quadrato GF. & quæ æqualia vni tertio æqualia inter ſe, ergo circuli I, L. ſunt æquales AB. CD.

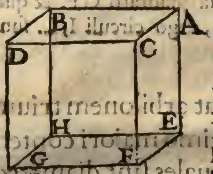
Circulum formare, qui capiat arbilonem trium minorum circulorum, ab imo maiori contentorum, qui tres circuli æquales ſint diametro continentis. Prop. *14.*



ESTO circulus AED. cuius dimetiens AD. tribus circuli diameteris intercidatur DC CB, BA. poſtulamus circulum formare, qui arbilonem, vel interceptam aream à maioris circuli cõcauitate, & minorum conuexitate contineat. Ex BD Diametro circulus

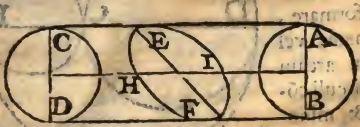
fiat BFD. & per superiorem propositionem 7, arbilon BFDC capiatur, mox lunulæ AEDFBC quantitas cognoscatur, à qua circulus AB. subtrahatur per 4. nostram, & sic de cæteris.

Si solidum cubum, vel parallelipedum altera parte longius oblique ex oppositis lateribus secetur sectio altera parte longius erit. Propos. 15.



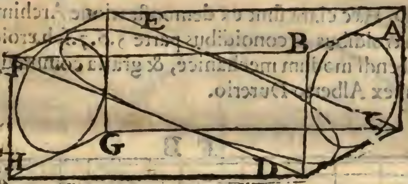
Esto solidus cubus ABCDEFGH & secetur à plano BDEF. oblique ex oppositis cubi lateribus BD. EF. dico BDEF. esse altera parte longius. Quia DG, GF, æqualis est. DF autem subiacens linea est æqualis duobus quadratis DG. GF. ergo longior BD. quæ ipsi DG æqualis est, idem dicendum de altera parte BH. HE. quia BE, maior est BH. HE. Igitur BDEF. altera parte longior est. Idem quoque dicendum de solido parallelipedo altera parte longiori.

Si Cylindrus plana secetur per obliquum sectio oualis erit. Prop. 16.



Sit Cylindrus ABCD. & secetur rectè ABG. sectio AGB. circulus erit, si oblique secetur, vt in IEHF. sectio sphærois erit ex ea quæ Serenus probauit in suis Cylindricis.

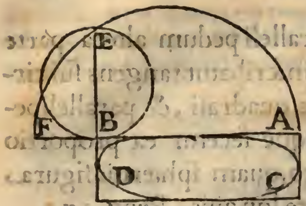
Si intra solidum paralleli pedum altera parte longius cylindrus inscribatut tangens sui circuli basis latera eius quadrati, & parallelipedum solidum obliquè secetur ea proportio erit circuli quadrato, quam sphærois figura ad suum altera parte longius. Prop. 17.



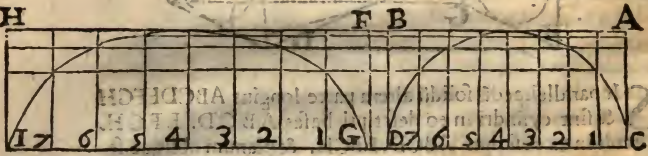
SIt parallelipedũ solidũ altera parte longius ABCDEFGH & sint cylindri in eo descripti bases AB CD. EFGH. circuli in ea descripti ABCD. EFGH. & planum obliquè secans illud sit CDEF. & sphærois in eo descripta CDEF. dico sphæroidem intra se descriptam eandem habere proportionem ad suam figuram altera parte longiorem, quam circulus ABCD. ad suum quadratum ABCD. cuius demonstrationem omittimus: nam ex his, quæ Euclides in suorum elementorum, 12. & Archimedes in 31. præpositione descripserunt, demonstratur.

Data sphæroide circulum eiusdem areæ describere. Prop. 18.

ESto data sphærois ABCD. iubeo circulum eiusdem spatij. Circa datam sphæroidem quadrangulũ circumscribatur



batur ABCD. & latus AD prolongetur vſque ad F. vt BF. ſit æqualis BD. Et circa AF. ſemicirculus deſcribatur, elongeturq. BD. donec circumferentiam feriat, & ſit in puncto E. dico circulum conſcriptum circa BE. diametrum continere aream ſphæroidis ABCD. Hæc clara ſunt ex demonſtratione Archimedis libro de ſphæroidibus,& conoidibus parte 5.6.7. ſphæroidem idem deſcribendi modum mechanicè, & gratia commoditatis proponam ex Alberto Durerio.

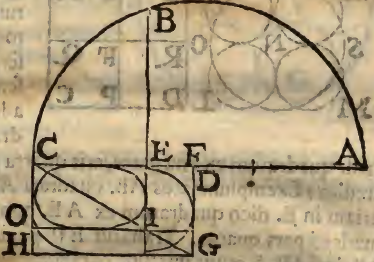


Deſcribe quadrangulum in duplo triplo, aut ſeſquialtero, & ſit in circulo ſupra AB. infernè CD. cuius latus CD. diuide in puncto E. per medium, ac poſito vno circini pede in puncto E. interuallo EC, ducatur per ſuperiorem partem vſque ad D. continget hic arcus lineam AB. deinde partire lineam CD. in octo æquales partes, & ex ſingulis diuiſionibus protrahe ſurſum parallelas in nuper deſcriptum arcum. Deinde fac iuxta quadrangulum ABCD. adhuc alium quadrangulum æqualis altitudinis, ſed longitudinis quantæ volueris cuius ſuperior linea FH. inferna vero GI. & ſeca id quoque in octo partes æquales, vt prius, poſtea producito ex ſingulis ſectionibus ſurſum lineas parallelas, deinde ex ſingulis inter

ſectio-

ſectionibus prioris arcus,quæ per octo lineas parallelas factæ ſunt, parallelas tranſuerſales per omnes perpendiculares longioris quadranguli,& per ſectiones illas longiorem parallelorum arcum produc lineam arcualem de puncto in punctum incipiendo ab angulo G. & finiendo in I, vt vides.

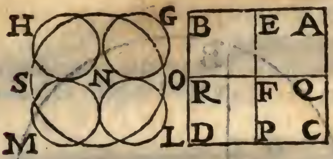
Datam ſphæroidem duplare, vel quadruplare. Probl. 19.



SIt duplandum quadrangulũ ECIO.quod idem eſt,ac duplanda ſphærois , quod intra illud circum ſcripta eſt,& quadrangulum erit ſimile, ſimiliterq. poſitũ, quemadmodum, & ſphærois. Producatur latus quadranguli EC.vſque ad A.& ſit AE. dupla ipſius AC. ac ipſius AC. medio D. poſito circini pede, DA interuallo, deſcribatur circulus ABC. producaturq. IE. vſque ad circumferentiam B. & erit EB latus vnum rectanguli deſcribendi. Reſcindatur igitur ex CA, linea CF, æquali EB, & ducatur diameter CI. deinde per F. ducatur parallela ipſi EI. quouſque occurrat diametro CI in G. & per G altera parallela ipſi FC producatur, quæ ſit GH compleaturq. parallelogrammum FH. erit igitur hoc parallelogrammum ipſi CI. ſimile, ſimiliterq. poſitum duplum. Quoniam AE. EB. EC. ſunt tres lineæ proportionales ex 13.6. Euclid. erit vt AE. prima ad EC. tertiam, ita parallelogrammum FH. ex EF. ſecunda

cunda (nam CF sumpta est æqualis EB.) ad parallelogrammum EO. supra tertiam EC, quod simile, similiterq. descriptum.

Si circuli diameter bifariam secetur, & ex vna parte circulus fiat hic erit totius pars quarta. Prop. 20.

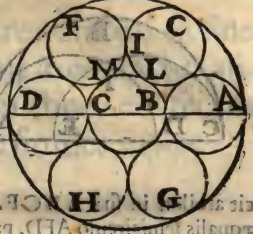


Rationes circulorum sequuntur rationes quadratorum eis circumscriptorum, vel inscriptorum, & quemadmodum, si quadrati diameter diuidatur quadratum ex vna parte, erit quarta parte totius, ita, & circulus; Exemplum latus AB. quadrati AD. diuidatur bifariam in E. dico quadratum ex AE. quod est AF. est AD quadrati pars quarta. Trahatur EP parallela, ipsi AC. & QR. ipsi AB, & erunt quatuor parallelogramma rectangula, & si aliter probari posset rationem recitabo apud Platonem in Memnone. Socrates enim puerum hoc modo docet. Sit bipedalis linea AB. dico suum quadratum esse quatuor pedum AQ erit vnius pedis, erunt dico quadrata QF. FR. sit & altera pars CD duos pedes longa vnum alta C. erunt enim duo quadrata CF. FD. tota igitur quatuor erit pedum. Sit ergo circulus OILM. cuius diameter ONS. diuidatur bifariam in N. ex quantitate ON. quatuor circuli inscribantur, dico quatuor hos circulos toti æquales esse. Ratio ex superiori pendet: nam & circuli se habent ad quadrata, vt eorum diametri.

Cir-

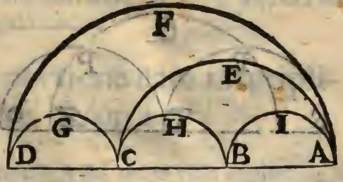
Circulorum vacua metiri, quando maior minores contineat. Prop. 21.

SIT magnus circulus AEFDHG, cuius diameter AD, diuidatur in tres partes, & in eo fiat tres circuli AB, BC, CD, & supra duo alij, & duo infra inscribantur; nam sex circuli æquales intra vnum inscribuntur ex 15. 4. Euclid. & ex præcedenti totus circulus nouem circulos cōtinebit: nam diameter trifariam diuisa est, sunt intus septem contenti, ergo omnia vacua duo erunt circuli cuius 3. pars erit scalprum EIF. cum suo residuo ILM.



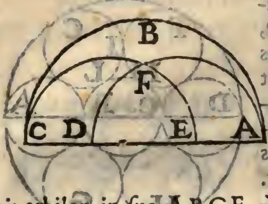
Arbilones per circulares figuras metiri. Prop. 22.

SIt arbilon primū AFDGCHBIA. inuestigādum quot circulos capiet, qualis AB. Ex præcedēti semicirculus AFD nouem capiet semicirculos qualis AIB si substuleris AIB, BHC, CGD, erit arbilon reliquum sex

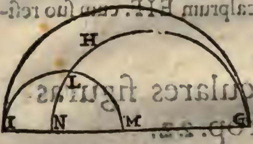


E semi-

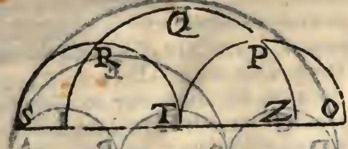
ſemicirculorum. Si quærimus arbilonem AFCHBI. erit ſemicirculus AEC quatuor ſemicirculorum qualis AIB, demptis duobus AIB, BHC, erit arbilon duorum ſemicirculorum. Si quærimus arbilonem AFDGCEA, erit ex iam dictis quatuor ſemicirculorum.



At ſi ſemicirculus maior ABC capiens duos ſemicirculos AED, EFC, vt docuimus in prima noſtri, dico arbilonem ABCFA eſſe æqualem duplato EFD, quod ex figura patet: nam quod replicatur in figura EFD deficit arbilon in ſua A B C F. Vel quarta pars dupli BEA. eſt æqualis ſemicirculo AFD. pars extera EFD eſt æqualis interiori corniculari angulo FBA.



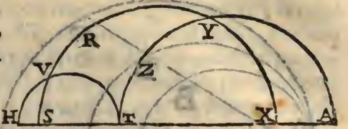
Idem eueniet in figura GHI: nam duo ſemicirculi GHLN, & MLI. per ſecundam noſtri capiũt aream continentis circuli G H I. Vnde duplatum MLN. eſt æquale arbiloni GHLIHG.



Poteſt etiam euenire, vt arbilon medium P Q R T eſt æquale duobus extrinſecis circuli partibus O P Z R S. ex ſuperiori ratione.

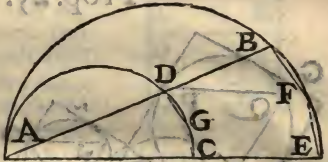
Idem

Idem eueniet in hac postrema, vt arbilon YZTVRY. sit æquale duobus circuli extrinsecis partibus A Y X, S V H.



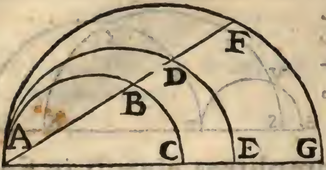
Si duo vel quamplures circuli in fine diametri se tangunt à contactus autem puncto ducatur linea eos secans arcus secti inter se similes erunt. Prop. 23.

Sint duo circuli ABE, ADC se mutuo tangentes in fine diametri A, & ducatur recta linea ADB, secans arcus ADC, in D, & ABE, in B, qui quidem arcus bifariam secentur, quia anguli in circulo oppositi per 22. 3. duo æquales rectis duobus in 2. ergo angulus BGC, & BFE æquales sunt cum eodem BAC angulo iuncto.



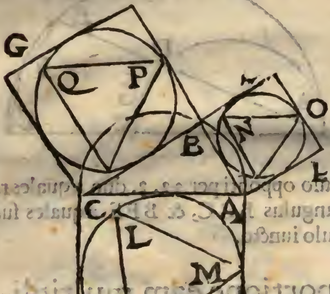
Data circuli portione eam multiplicare, Prop. 24.

Sit data circuli portio AB, quam volo duplare & sit eius circulus ABC, & sit semicirculus ADE du-



plus dati. Per primam nostri, linea A B trahatur longius in D, & si voluerimus quadruplare sit circulus A F G quadruplus & linea A D in F extẽdatur, dico portionem DA ipsius BA duplam, & FA ipsius BA quadruplam cuius ratio pendet ex anteriori.

Ex duabus portionibus similibus vnã similem facere, vel subtrahere. Prop. 25.

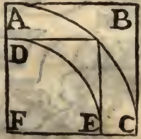


Sint duę inæquales circuli portiones PQ. ON. sed similes, & sit vnaqueque tertia circuli pars per 25. 3. Eucli. & sint P Q G, ODN; circa quos dscribantur quadrata B G, E B, vel eorum diametri, & iungantur ad rectum angulum ABC, & secundum AC describatur quadratum, & in eo circulus MLI; & sit ML latus æquilateri trianguli. Portio ML erit æqualis iam dictis dua-

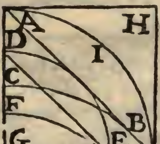
duabus portionibus per ea quæ in 3. Euclid. probantur. Vel si ex ML voluerimus portionem PQ subtrahere, è recto quadrato AC, ac supra AC semicirculo descripto, ponatur latus quadrati BC, & eius latus BA latus quadrati portionem similem continentis. Et sic possumus ex pluribus portionibus vnam facere, & omnia illa, quæ de integro circulo retulimus.

Datum semicuruilineum triangulum duplare, subducere, vel è duobus similibus vnum facere. Prop. 26.

SIt semicuruilineum triangulum DGE, quod volo duplare, & sit circuli quarta pars FDE, fiat etiam circuli dupli pars, & sit AGC, circa eam quartam etiam quadrati partem circumscribo ABCF, dico triangulum semicuruilineum ABCG. duplum esse DGE, Quia quadratum ABCF duplum est DGFE inscripta portio proportionalis erit. Et sic subtrahere, & ex multis vnam facere poterimus ex supradictis.



Eodem modo triangulum DEG duplare poterimus, quod est æquale iam dicto: nam quadrati dimidium BHA est æquale BAG, si dematur portio BIA, æqualis BCG. remanet triangulum BAG. æquale BHA, iam dicto.



dicto. Vnde si voluerimus prædictum EDF semicurtuilineum triangulum duplare, duplato quadrante HABG, protractoq. diametro BA. circulus duplus BIA, qui erit BC descributur BC, & erit triangulum ABC duplum trianguli EDF.

IO.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Secundus.

AXIOMATA.

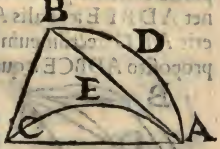
I.

SI eidem addideris, quod prius dempseris, quantitas æqualis erit.

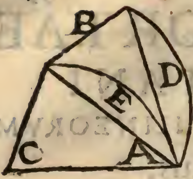
II.

Si nota quantitas à nota subtrahatur, quæ remanet nota erit.

Triangulum semicuruilineum ex æqualibus, ijsdemq. circumferentijs compositum quadrare. Prop. 1.

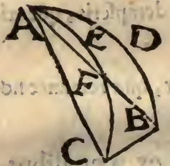


ESto triangulum quodpiam semicuruilineum A D B C E, Aequalibus nimirum ijsdemq. circumferentijs ADB, AEC, & recta BC basi constituta volo illud quadrare. Ducatur linea AB, & AC; aio aream trianguli semicuruilinei ADBCE esse æqualem triangulo rectilineo A B C. Quoniam circumferentia A D B est æqualis portioni A E C, ablata A D B, repositaq. in A E C æquale remanet triangulum rectilineum A B C semicuruilineo per primum axioma nostrum.

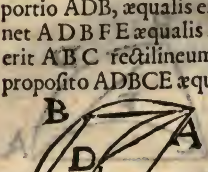


Vel fiat triangulum æquale rectilineum ABC, & ſit AFC ex 22.1. Euclid. erit ſemicuruilineum triangulum ADBCE, æquale triangulo ſemicuruilineo AECF dempta communi portione AEC remanet rectilineum AFC triangulo ſemicuruilineo æquale ADBCE.

Alter Caſus.

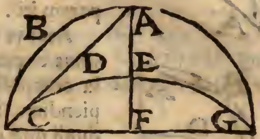


At ſi triangulum ADBCE anguſtius erit, & portionis lineæ neutiquam intactas circumferentias relinquent, ſed per medium tranſibunt, eadem operatione idem aſſequi poterimus. Sed quo res dilucidior euadat, rem exemplo complectemur. Eſto triangulum ADBCE, & circumferentia ADB æqualis ſit AFC, trahanturq. rectæ lineæ AB, AC, & ſecet AB baſis ADB circumferentiam AEC, aio rectilineum ABC æqualem ſemicuruilineo ADBCE. Quoniam portio ADB, æqualis eſt AEC dempta communi AEF, remanet ADBFE æqualis AFC, apponatur vtrique areola FBC, erit ABC rectilineum triangulum ſemicuruilineo triangulo propoſito ADBCE æquale.

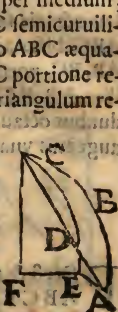


Vel ad eadem præſtanda poſſumus eaſdem circumferentias in plures partes diuidere, nempe binas, ternas, quaternas, vt ABC circumferentiam in AB, BC, & ADE in AD, DE. Vnde excluſæ partes AB, BC, incluſis AD, DE erit area rectilinea ABCEDA æqualis ſemicuruilineo ABCEDA.

Triangulum ſemicuruilineum ex varijs circumferentijs compoſitum quarum altera alterius dupla ſit quadrare. Prop. 2.



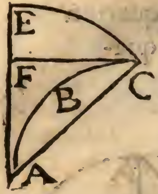
ESto triangulum ſemicuruilineum ABCDE cuius circumferentia E D C ſit circuli dupli ipſius ABC. Sed EDC ſit octaua pars circumferentiæ ſui circuli G E D C, circuli vero A B C quarta. Aio triangulum ſemicuruilineum ABCDE rectilineo inueſtigari poſſe parem. Rem ita moliemur. Compléta circumferentia C E, ſit CEG, & coniungatur AC, mox portionem CEG diuidatur per medium, & ſit diuiſionis linea E F, dico triangulum AFC ſemicuruilineo triangulo parem eſſe. Quoniam tota portio ABC æqualis eſt dimidiæ ECF, id propterea dempta A B C portione repoſita E F C ſemicuruilineum ABCE, abijt in triangulum rectilineum A C F.



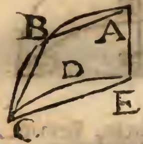
At ſi circulares lineæ magis cohærebunt, vt circumferentiarum baſes introrſum ſe ſecent, eadem erit operatio, & demonſtratio, vt in prima propoſitione. Productis lineis portionis A C, & ſemiportionis EFC triangulum rectilineum AEFC ſemicuruilineo par erit. Quoniam ſpatia ipſarum portionum ABC, EFC æqualia ſunt, ablata interiacente portione D C, quod reliquum eſt ABCD ipſi EDCF æquale erit, addita vtrique areola AED, erit totum triangulum rectilineum AEFC toti ſemicuruilineo A B C D E æquale; nam quanta pars ex

F dem-

demptione abijt, tota ex repositione substituta est.



Vel potest transpositis lineis alio modo triangulum semicuruilineum constitui sit circumferentia dupli C D E retro C B A ante, tunc ex puncto C. super basim A E cadat perpendicularis C F, & connectatur C A, & sic triangulum semicuruilineum A B C D E rectilineo F C A parem iri. Ratio in superiori.



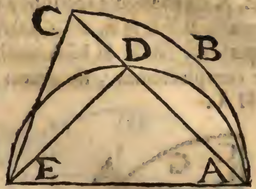
At si vt diximus ex varijs, & inæqualibus circumferentijs orbiculata triangula composita erunt, tunc mente concipiendum, si circulus duplus alteri sit, subdupli duæ circumferentiæ partes, vni dupli respondent, si quadrupli quatuor, & sic deinceps. Esto verbi gratia circuli dupli circumferentia E D C, & sit octaua suæ circumferentiæ pars respondet duobus octauis subdupli circuli A B C. Diuidatur ambiens linea ABC bifariam in B, & trahatur A B, B C, E C, & erunt duæ AB, BC portiones, vni EC æquales; & sic vna E D C, duas illas A B, B C absumet. Vnde si triangulum semicuruilineum duabus octauis circumferentiæ partibus decrescimus, AB, BC augemus vna EDC, & sic par pari referemus.

Alter Casus.

POtest & aliter euenire; sit triangulum semicuruilineum A B C E D, & sit A B C quarta dupli circuli, & A D E semicirculus subdupli, docebimus quomodo possis rectilineũ triangulum æquale semicuruilineo facere. Trahantur ex puncto per medium circuli A D E vsque ad C, & sit linea ADC, & linea DE. Erit triangulum semicuruilineum A B C E D

æquale

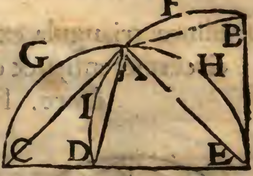
çquale rectilineo DCE. Quoniam portio A B C est dupla ipsius AD per 19. primi nostri, & huic nempe portioni AD æqualis DE. dematur dimidia portio ABCD, addatur DE compar., remaneatq. communis areola DCEF, vtrique sic enim rectilineum



triangulum DCE æquale semicuruilineo ABCED, & sic excessus vnius alterius defectu rependetur. Sic & in alijs notis circumferentijs quadruplis quintuplis eodem Methodo vti poteris.

Semicuruilinea triangula ad verticem constituta ex eisdem, & æqualibus circumferentijs, vel ex æqualibus nota quadrare. Prop. 3.

SI duo semicirculosa triangula ad verticem constituta ex eisdem, & æqualibus circumferentijs fuerint ductis à vertice ad bases rectis lineis, erunt rectangula circulosis çqualia. Si primam huius libri leges non secus esse inuenies, quã

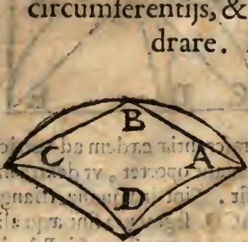


diximus. Si acciderit, vt circumferentiæ eædem ad verticem sint inæquales, sed in id conueniant oportet, vt dextra interior sinistræ exteriori æqualis sit. Sint inæqualia triangula se inuicem decussantia BAE, ACD, segmenta sint æqualia vt BFA, AID, & EHA, AGC, tunc protractis rectis BA, AD,

AE, AC, triangula rectilinea BAE, ADC, erunt circulosis æqualia BFAHE, AGCDIA. Quoniam segmentum BFA æquale est AID. Si BFA seorsum expellimus,& AID sua vice complectemur, sic etiam reijcimus AGC reponimus EHA.

At si fuerint duo semicuruilinea triangula BEAFD, & AGCIH constituta ad verticem A ex inæqualibus circũferentijs notis quarum DAC sit circulus duplus ipsius BAI. Trahantur duæ lineæ perpendiculares ex A ad CI. & sit AL, & AM ad BI. & binæ aliæ rectæ BA, AI, dico rectilinea triangula ALI, ABM, simul iuncta æqualia esse. Semicuruilineis BEAFD, CGAHI. Quoniam periferia DAC est circuli dupli quarta, & BAI subduplus semicirculus, duæ semiportiones AFDM, AGCL, absument duas portiones BEA, AHI. demptis igitur BEA, AGCL, repositisq. AHI. AEBM, rectilinea triangula BAM, LAI, æquiualebunt semicuruilineis iam dictis.

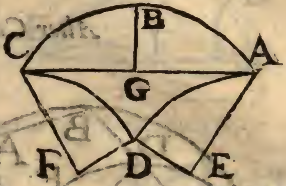
Curuilinea triangula ex eisdem & æqualibus circumferentijs, & ex varijs notis quadrare. Prop. 4.



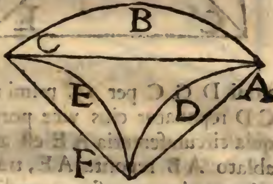
Esto curuilineum triãgulum ex tribus circumferentijs ABC, CD, DA, eiusdem curuis, sed ABC, dupla AD, DC constitutum quod quadrare intendimus. Dico protractis

ctis æqualibus subtensis AB, BC, CD, DA quadrilaterum rectilineum ABCD, esse æquale curuilineo ABCD. Quoniam demendo portiones AB, BC, addendoq. AD, DC, quæ simul æqualia sunt voti compos fies, vel aliud dicimus.

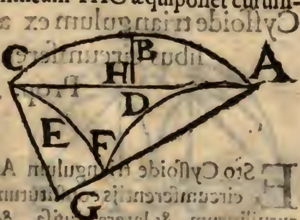
Poterimus alio modo id assequi. Protrahatur linea AC, & binas AE, ED, & lineas CF, FD, vt semiportio AED sit æqualis ABG, & DCF, & ipsi BGC, nam duæ portiones dimidiatæ ADE, CDF æquiualent vni integræ ABC. Vna hac dempta, his additis quod diximus eueniet.



Eodem modo curuilinea triangula ex inæqualibus circumferentijs, sed altera alterius exempli causa sit dupla. Sit curuilineum triangulum ABCEFD ex inæqualibus circumferentijs, sed ABC dupla sit ADF, & FEC subtensis lineis AC, AF, FC erit quadratum nempe binæ portiones ADF, EFC æquipollent simplici ABC, vnde illa dempta, his additis triangulum rectilineum FAC æquipollet curuilineo proposito.



Potest contingere, vt triangulum constituatur ex varijs circumferentijs, & inæqualibus, vt FEC sit dimidia ipsius ABC, & ipsa ABC dupla ipsius ADF, sic facta semiportio-



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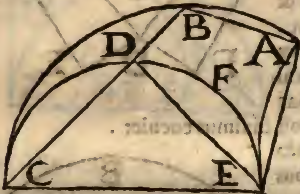
ctione CFG, æquali BHC, & subtensis A F portio A D F erit æqualis ABH. Vnde hac dempta, illis subditis triangulum rectilineum ACG erit æquale curuilineo ABCEFD.

Alter Casus.



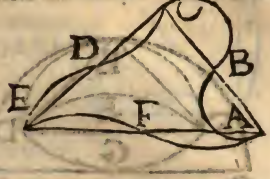
ESto curuilineũ triangulum ABCDFE propositum quadrãdum, & circumferentia circuli A B C sit dupla E F D G C, diuidatur circumferentia E D C bifariam in D, & trahatur C D B erit ceratoide triãgulum B H C G D æquale portioni D G C per 19. primi nostri. Vnde dempto B H G C D reponatur eius vice portio E F D æqualis D G C, & quia circumferentia A E est æqualis, & eadem ipsius A B, ablato A B reposita A E, trapezuim rectilineum A B D E erit æquale proposito curuilineo triangulo A B H C G D E F.

Cyssoide triangulum ex æqualibus, & inæqualibus circumferentijs quadrare.

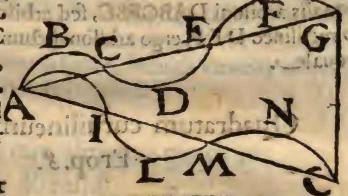
Prop. 5.

ESto Cyssoide triangulum A F C ex tribus inæqualibus circumferentijs constitutum A B C, C D E, E F A curuilineum, & latera diuisa, & æqualibus circumferentijs con-

constituta, vt A B, sit æqualis B C, & C D, ipsi D E, & E F ipsi F A, vnde tractis lineis rectis AC, CE, E A, & demptis tribus circum ferentijs BC, DE, FA, & alijs tribus repositis A B, C D, E F, rectilineum triangulum A C E æquale est cyssoidi ABCDEF.

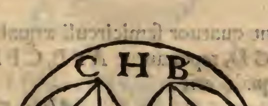


Sit quoque semicyssoide triangulum quadrandum A B C D E F G I L M N O, ex varijs circulorum circumferentijs, sed tamen binis semper oppositis æqualibus constitutum videlicet G F E maioris circuli circumferentia, quam E D C, & E D C maior C B A, sed tamen G F E æqualis O N M, & E D C, I L M, & C B A, A H I, si à puncto A ad basim G O lineæ rectæ trahantur, totum assequeris, ratio pendet ex superiori.

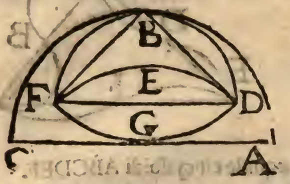


Arbilonem quadrare. Prop. 6.

Esto arbilon A H E C D B quadrandum, quia portio A H est dupla AB, & AB est æqualis semiportionis B G D, ergo ablata A B H, & reposita

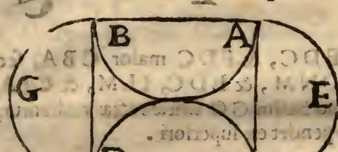


posita BGD, & ablata HCE reposita DCF, rectilineum GBHCF est æquale iam dicto arbilioni.



Potest & alio modo probari: semicirculus ABC est duplus semicirculi DBF; ergo vacuum ABDGFBC. est æquale semicirculo, dematur ex vtroq; portio DEF, DGF; ergo lunula DBFE est æqualis arbiloni DABGFBC, sed arbilon est æquale triangulo rectilineo DEF, ergo arbilon dictum triangulo DBF, est æquale.

Quadratum curuilineum quadrare. Prop. 8.

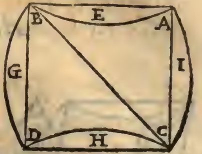


ESto quadratum curuilineum AFBGDFCE. trahantur quatuor lineæ ex angulis AB, BD, DC, CA; dico quadratum rectilineum ABCD curuilineo iam dicto præstabit. Quoniam sunt quatuor semicirculi æquales inuicem, tollantur AEC, BGD, reponantur AFB, CFD, sic rectilineum curuilineo æquale erit.

Alter Casus.

POtest & quadratum aliter fieri, ex quatuor etiam rectis angulis, vt diximus ABC. Quoniam portiones æqua-

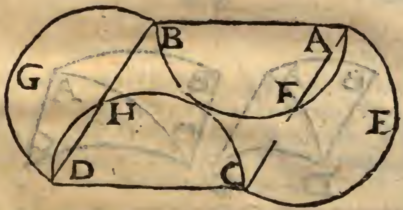
æquales ſunt, & ex æqualibus circulis, ablatis portionibus A I C, B G D, repoſitiſq. A E B, C H D rectilineum quadratum ABDC, curuilineo A E B G D H C I A æquipollebit.



Corollarium.

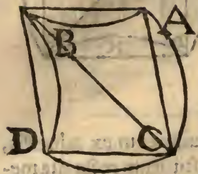
HInc patere poteſt quadratum curuilineum ex aduerſis, & conuerſis circumferentijs conſtitutum recta diameter bifariam ſecat, latus A B, lateri A C æquale eſt, & baſis B C communis vtrique, ergo triangulum C A B triangulo B D C æquale erit: igitur bifariam ſecat, & vtrumq. ex conuexo, & concauo æquali latere conſtat.

Rhombum curuilineum quadrare. Prop. 8.



ET Rhombus curuilineus A F B G D H C E quadrabitur, ductis ex angulis rectis lineis AB, BD, DC, CA, nam demptis ſemicirculis A E C, D B G, repeſitiſq. AFB, C H D, demptiſq. portionibus HDAF, rectilineum Rhombum curuilineo æquabitur.

Alter Casus.

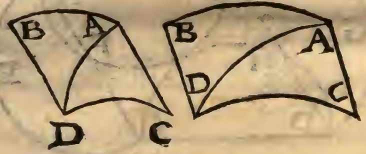


POteſt eſſe Rhombus alio modo ex æqualibus circumferentijs AB, BD, DC, CA, & quoniam portiones æquales ſunt, duabus demptis AC, CD, totidem repoſitis AB, BD erit rectilineo æqualis.

Corollarium.

EIuſmodi etiam Rhombos recta dimetiens æqualiter ſecabit; nam hinc inde duo æqualia triangula conſtituent.

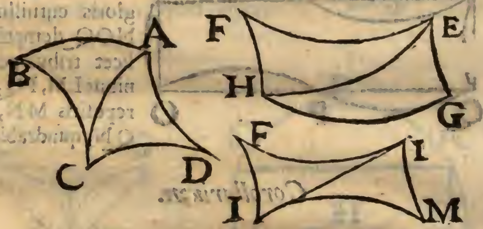
Rhombos, ſeu Rhomboides ſemicuruilineos quadrare. Prop. 9.



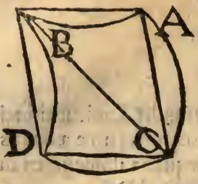
SEmicuruilineus Rhombus, & Rhomboides facilius quadrabitur: nam portione vna dempta, altera repoſita, æquales erunt curuilinei rectilineis.

Corollarium.

SEd in iſtis, qui ex iſoſcelibus triangulis ſemicuruilineis conſtituuntur curua diameter circumferentiæ æqualis, & eos bifariam ſecabit; nam in duo æqualia iſoſcelia triangula diuiduntur ſemicuruilinea, vt ABD, ADC.

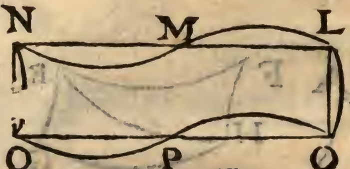


Poſſunt & alio modo Rhombos, & Rhomboides in Iſoſcelibus triangulis conſtitutos ex tribus conuerſis, & vna auerſa diametro per mediam diuidere, vt in Rhombo A B C D. Rhomboide E F G H, cum diameter A C, E H eos bifariam diuidat in duo Iſoſcelia æqualia A B C, A C D, & E H G, E H F, & in Rhomboide ex quatuor conuerſis conſtituto diameter recta etiam I L in duo ſemitriangula æqualia diuidit ex oppoſitis angulis ducta.



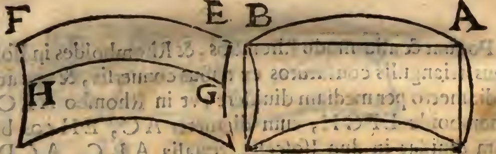
Altera parte curuilinea, & ſemicuruilinea quadrare. Prop. 10.

ALtera parte longiora quadrabis omnia, vt quadrata, duobus ſemper portionibus oppoſitis ablatis, & repoſitis, vt in ABCD.



Erit altera ſpecies altera parte longioris curuilinei LNOQ demptis ſcilicet tribus portionibus LM, PQ, OL, repoſitis MN, OP, QN, quadrabitur.

Corollarium.

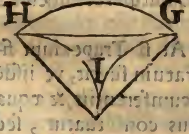


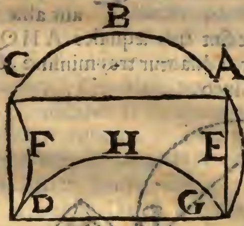
AT reliquas ſpecies diuides non dimetiente ex angulo ad angulum ducta, ſed per medium vtrinq. latera parallela, vt in EFIL dimetiens GH.

Pe-

Peleces quadrare. Prop. 11.

POſſunt peleces multifariam variare ex varijs circulorum circumferentijs, & primo ex partibus, cuius partes circumferentiæ dimidij circuli A B C, aliæ duæ partes ex duabus quartis eiuſdem circuli A E D, D F C, vt demptis illis, his repoſitis, rectilineum quadratum peleci æquale erit.

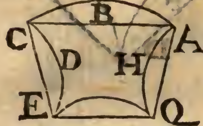




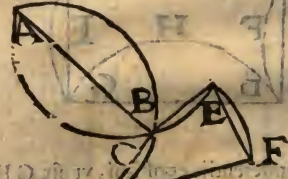
Poteſt & ex duplicis circumferentijs conſtitui, vt ſit G H quarta dupli, duæ vero quartæ ſubdupli G I, I H, quæ additæ rependent ablatum G H, eodem modo ex quadrupla eueniet. Pelecis ex inæqualibus, ſed eiſdem circumferentijs, & varijs, vt Pelecis G E A B C F D H quadranda portio A B C ſit æqualis G H D, & D F C, G E A, demantur A B C, reponantur G H D, D F C, & erit quadrilaterum rectilineum A C G D æquale ſupradictæ Peleci.

Trape-

Trapezia curuilinea ex æqualibus, & inæqualibus circumferentijs constituta quadrare. Prop. 12.



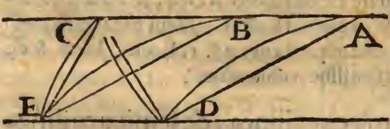
SInt Trapezia curuilinea ex quatuor, vel pluribus circumferentijs constituta, vel omnibus inæqualibus, vel tribus, aut duobus, dummodo inter eas ita conueniant, vt tres, duæ, aut plures possint, quantum vna, aut aliæ : nam sit portio A B C tripla, & sint tres æquales A H Q, Q F E, E D C, dematur maior, addantur tres minimæ, & coæquabitur rectilineum curuilineo.



At si Trapezium figuratum fuerit, vt ijsdē circumferentijs, & æqualibus constituatur, sed cū alterū altero longius sit, & quantum in altero deficit in altero superfit, minus addatur superfluo, & fiat æqua compensatio. A B duæ portiones demantur, addantur duobus alijs B C, C D, & quia pars E F superabit, deficit vero E B, huic addatur illius vice, sic rectilineum B E F D C B curuilineo æquabitur.

Trian-

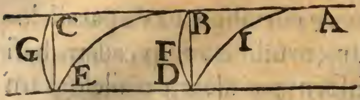
Triangulum Isoscele curuilineum,& parallelogrammum semicuruilineum in eadem basi constituta,& eisdem parallelis,parallelogrammum triangulum duplum erit, & rectilineis æqualia erunt. Prop. *13*.



SIt triangulum Isoscele semicuruilineū DCE, & parallelogrammum semicuruilineum ABDE in eisdem parallelis ACDE dico parallelogrammum in eadem basi, & eisdem circumferentijs constitutum esse triangulo duplum. Quoniam portio DC ipsi CE æqualis, dematur EC, addatur DC, erit triangulum rectilineum DCE curuilineo æquale. Et quia portio AD ipsi BE æqualis, dematur BE, addatur DA erit rectilineum parallelogrammum ABDE semicuruilineo æquale, sed rectilineum ABDE triangulo DCE duplum est; quia in eadem basi, & eisdem parallelis constituta per 41. 1. Eucl. ergo parallelogrammum rectilineum curuilineo triangulo duplum.

Parallelogramma semicuruilinea in eadem basi, & æquidistantibus circumferentijs constituta, & inter parallelas æqualia sunt. Prop. *14*.

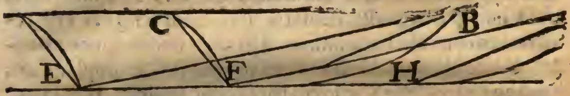
SInt duo parallelogramma BFDCGE, & AIDBHE in eadem basi DE, & in eisdem parallelis rectis AC, DE



D E conſtituta, dico inuicem eſſe æqualia: trahantur rectæ A D, B E, E C, quia portio BFD eſt ęqualis CGE dematur CGE, reponatur B F D, rectangulum parallelogrammum curuilineo æquale. Idem dicendum de altero parallelogrammo AIDBHE curuilineo æquale eſt rectilineo ADBF, & quia parallelogramma rectilinea in eadem baſi, & eiſdem parallellis conſtituta ad inuicem ſunt æqualia per 36. 1. Euclid. Idem & de parallelogrammis curuilineis dicendum.

Parallelogramma curuilinea, & ſemicuruilinea cum æqualibus baſibus,& eiſdem circumferentijs,& eiſdem parallelis conſtituta inuicem ſunt æqualia.

Prop. 15.

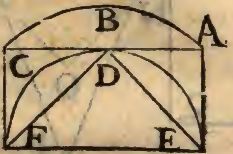


Sint duo parallelogramma ſemicuruilinea, & æquidiſtantibus circumferentijs AH, GB, & CF, DE, & æqualibus baſibus conſtituta FE, GH, & in eiſdem parallelis A D, HE dico eſſe inuicem æqualia, trahantur rectæ AH, BG, CF, DE, AF, B E, quia A H portio æqualis eſt B G, dempta AH repoſita BG, erit rectilineum AHBG curuilineo æquale,& idem de alio CFDE, ſed rectilineum AHBG curuilineo æquale,& idem de alio C F D E, ſed rectilineum CFDE in eadem baſi cum rectilineo ABFE, & ABFE in eadem cum A H B G, ergo inuicem æqualia per 26. 1. Euclid. ergo &c.

Paral-

Parallelogramma ſemicuruilinea in eiſdem parallelis conſtituta, & ex diuerſis circumferentijs videlicet duplis dari poſſunt rectilineis æqualia.

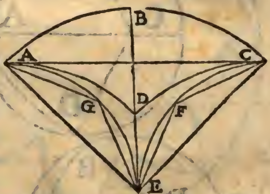
Prop. 16.



SIt parallelogrammum ſemicuruilineum E A B C F D E, & ſit portio CBA dupli, ſubdupli autem ſemicirculus F D, dico quadrari poſſe, trahatur linea C A, & F D, D E, quia duæ portiones ſubdupli F D, D E valent quantum vna ſubdupli CBA, dematur C B A, reponantur duæ ſubdupli F D, D E, rectilineum E A C F D valet quantum ſemicuruilineum.

Triangulum tricuſpidale quadrare.

Prop. 17.

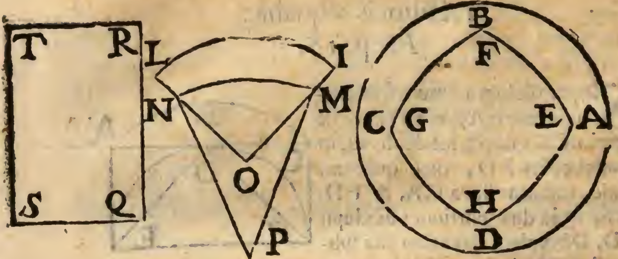


EX quarta noſtri ſecundi repræſentetur figura AB-C F E G, à medio AC trahatur linea BE, & linea E B ſignetur in linea B E, linea C D ex eadem dupli circumferentia idem ex altera parte, dico triangulum tricuſpidale ADCFEGA quadrari Poſſe, diuidantur EC, EA bifariã in FG, & trahãtur lineę E F, F E, E G, G A, ſic, & lineæ D C, D A, quia D C portio eſt octaua pars ſui circuli, portiones EF, GC duæ octauæ ſubdupli æquipollent vnam dupli, ſic eam demendo, has adden-

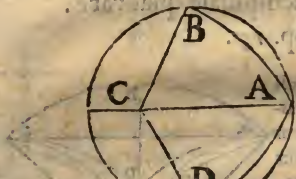
H do,

do, trapezium EFCD rectilineum reſpondet curuilineo EFCD, idem de alia parte dicendum; & multifariam poteſt euenire.

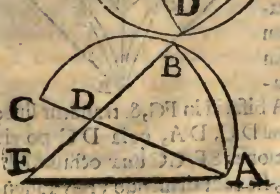
Coronas quadrare. *Prop.18.*



SIt quadranda Corona ABCDEFGH, pono eius quadrantem ILO, & ibi comparem octauã partem circuli dupli MNE, tollatur cõmune MNO, remanet tricuſpidale triangulũ quadrilaterũ MONP æquale quartę parti coronę IMLN, quæ æqualis ABEF, quadruplicetur cuſpidale triangulũ, & erit ipſius area QRST æqualis coronæ propoſitę.

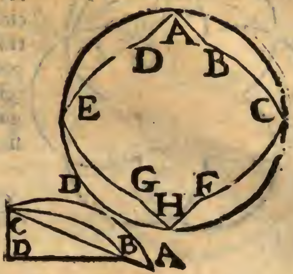


Eodem modo quarta pars ſemicirculi dupli ABE abſumit dimidium circulũ ABC ſubduplum, tollatur commune triangulũ ABD, remanet ADE triangulum rectilineum æquale Lunæ AB, & circuli BDC, quo duplato æquipollet coronę ABCD.

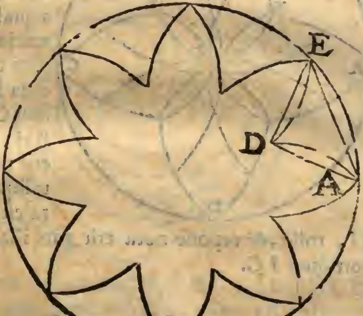


Sit

Sit portio ADGB, æquipollet dimidiæ duplæ BCD, tollatur commune BC, remanet triãgulum BCD æquipollens semilunulæ ABCD, sic quatuor triãgula BFGD absumunt coronam CBADEGHF.



Per quartam nostri secundi quadratur triangulum curuilineum ADE per rectilineum quadrangulum ABCD, sex igitur eiusmodi quadrãgula totam coronam absorbent.



Eodem modo alia coronæ species quadratur, & sit eius pars AED, cuius maior circulus AE sit duplus AD,

& ſit A D octaua pars ſui circuli, & A E ſui circuli, duæ igitur portiones A D, D E æquipollent vni maiori: octo igitur eiuſmodi triangula reſpondent propoſitæ coronæ.

Corona ſemiquadranda.

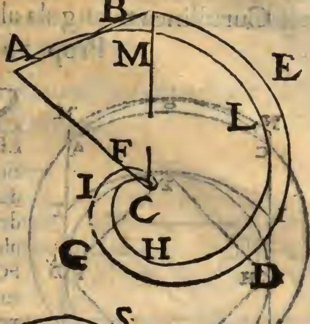
Esto circulus ABCD cuius quadrans ABI, triangulum ABE notum eſt, quia AE, E B æquales ſunt circumferentiæ A K, K B, reliqua pars quarta E F B H L I, quia B F, B H æquales ſunt G F, G H, tolle F B, B H, repone G F G H erit nota pars F B, H G, reliqua pars E F, I G nota eſt, quia æqualis FE, EI, tolle, & repone nota erit pars illa, remanent ergo 4. portiones I G.

Volutas omnifarias quadrare. Prop. 19.

Est voluta figuræ ſpecies in cocleæ modum ſinuata, cuius ambiens perpetuo flexu ducitur binis in ſe quodammo-

dammodo recuruis, & refractis lineis.

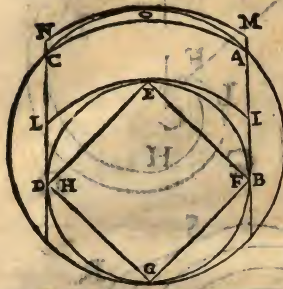
Propositum ergo sit quadrare volutam BED GIFCHLMA scio hanc volutam octauam esse partem volutæ circuli NOPQRS, & omnes circuli volutæ non capiunt nisi octogoni aream, ergo vnaquæque octauam partem com-



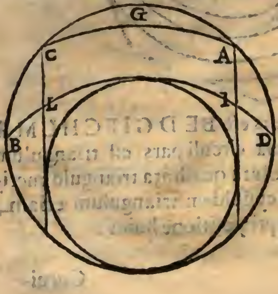
plectitur: vna igitur volutæ pars est BED GIFCHLMA est octaua circuli pars, & octaua circuli pars est triangulum ABC, ergo tota proposita voluta quadrata triangulo metitur. Possumus, & hoc modo cyssoidem triangulum etiam quadrare, quod vidimus in 5. propositione huius.

Curui-

Curuilinea triangula aliqua quadrare. Prop. 20.



SIt circulus duplus AMNC, subduplus vero EFGH, seq. in puncto contingant G abscindantur à duplo duæ portiones quadrati CN, AM, & à subduplo quatuor quadrati E F, FG, GH, HE remanent vacua CDEBA, BMG, GNH æqualia quadrato E F, G H puncto E ducatur parallela CA, & fit L O quadrangulum C L A I notum est, remanent quatuor triangula L D E, EIB, AMO, CNO puncto dupli circumferentia ducatur MN, & ex punctis C A alia parallela eiusdem circumferentiæ CA, dico lunulam C O A quadrari posse triangula N C O, OAM nota sunt, quadrangulum N C M A notum, quia ex parallelis circumferentijs, à quo si triangula subducantur C O A lunula nota remanet.



Quomodo lunæ cornicula quadrari possint. Prop. 21.

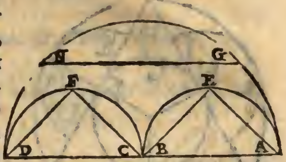
REmaneat superior descriptio; & in semicirculo B G D describatur dupli circumferentia BLID à punctis BD, lunula igitur BG-

BGADILB nota est, lunula parua nota est CGA, quadrangulum CLAI notum etiam ex anteriori, remanent ergo corniculi CBL, AID etiam noti.

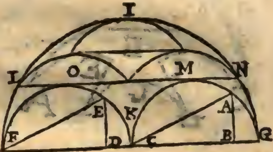
Trapezia multa curuilinea quadrare.

Prop. 22.

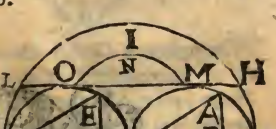
POssumus quadrare Trapezium AGNDFCBEA, quia semicirculus AGND est quadruplus AEB per 20. nostri, duo semicirculi AEB, CFD valent quantum arbilon AGNDCBA, dematur portio GN quarta circuli pars, & 4. portiones AE, EB, CF, FD, remanent duo triangula rectilinea AEB, CFD æqualia trapezio curuilineo iam dicto.

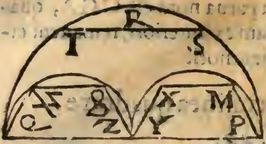


Eadem ratio erit in trigono. sit trigoni portio LIN, & duo circuli FED, CAG, à quibus duæ portiones FE, CA, & duæ dimidiæ ED, AG, quæ vnam integrant, altera erit OIM, arbilon FLINGMCO valet duos semicirculos, à quibus si tres dempseris portiones, tres item ab arbilone, vacua FLO, OKM, MNG, NMI, IOL valent duo trigona FED, CAB.



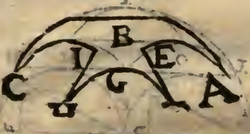
Eadem ratio erit in exagono, & trigono, nam in trigono in circulo GHILF, duo trigona APC, DEF, æquipollent vacuis GHM, MOC, OLF, HILONM, & in exagono PSRTQ, duo

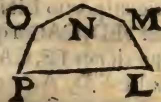




duo ſemiexagona PMXY, & Z 8 ς Q, valet vacuum BSITQYZ, in linea HL, tangens circumferentiam circulorum eſt latus trigoni æquilateri per 12.13.Eucl.

Circulus ABC, eſt quadruplus DAE, ergo pars tertia circuli ABC, quæ eſt ABC, eſt vnius circuli, & tertiæ partis, pars eius tertia eſt FGH, reliquum ergo erit corona ABCHGF dematur duo quadrantes circuli AEF, CHI, remanet vacuum AEFGHICBA, quantitatis dimidij circuli, & quia



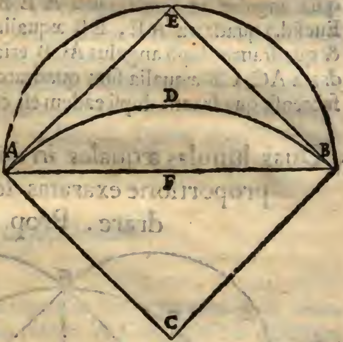


octaua pars circuli maioris, valet quatuor minoris dematur portio B ex maiori, & 4. 8. ex minori LM, MN, NO, OP, ergo rectilineam LMNOP, valet trapeſium AEFGHICBA.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Tertius.

In quo de Circuli quadratura agitur.

Lunulam ex dupla, & ſubdupla proportione quadrare. Prop. 1.



DEſcripto duplis circuli quadrãte his characteribus diſtinguatur ADBC, cuius ſubtenſam A B, ſcinde bifariam, & punctus ſciſſionis adamuſſim medius F charactere ſortiatur, in quo circini pede infixo ex FA interuallo circum ducto ſemiambitum ſubdupli AEB ducito, aio triangulum rectilineum ABC interceptæ lunulæ areæ AEBD æqualem eſſe. In medio periferiæ ſubdupli E punctus inſtituendus, & ab vtraque circuli extremitate A B lineæ excurrant vſque ad E, ibique mutuo concurrant, quia dupli portio A D B F quarta ſui circuli pars valet quantum duæ ſubdupli portiones A E, E B, etiam ſui circuli pars quarta (per 20. primi noſtri) ideo

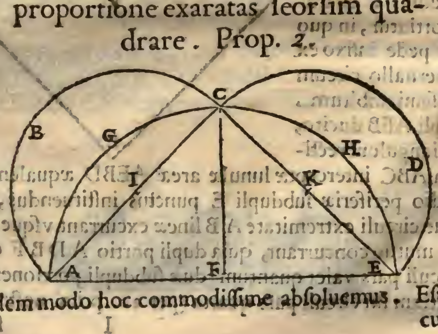
ſubductis portionibus A E, E B appoſita A D B (per primum axioma noſtri ſecundi libri) triangulum ABC valet quantum lunula AEBD, quod erat demonſtrandum.

Hyppocrates hoc aliter probat in primo Phyſicorum Ariſtotelis, quia quadrans dupli ADBC valet quantum ſemicirculus ſubdupli AEB, abſciſſa portione communi A D B, quæ inter vtrumque intericcta eſt, remanet trimetrum A B C æquale lunulæ AEBD, quadrandæ.

Conſectarium.

Ex hoc circumferentia dupli tranſibit ſemper per extremitates diametri ſubdupli, quod in alijs non euenit; quia angulus in ſemicirculo A E B rectus eſt (per 31.-3. Euclid.) quadrata A E, E B æqualia ſunt quadrato A B, & quadrantis dupli angulus ACB etiam rectus eſt, ergo quadrata AC, CB æqualia ſunt quadrato AB, ob id recta linea ſubtenſa quadrantis dupli eadem eſt cum diametro ſubdupli.

Duas lunulas æquales in dupla, & ſubdupla proportione exaratas, ſeorſim quadrare. Prop. 2.



Eodem modo hoc commodiſſime abſoluemus. Eſto circulus

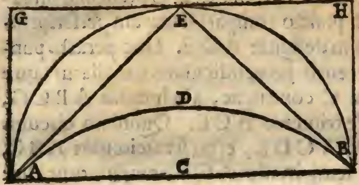
culus dupli A C E, & diametri extremitatibus A E binæ lineæ in medium circuli anfractum excurrant, & vbi mutuo contactu angulum efficiunt, illic C litera exaretur. Subtensæ AC, CE in medio ductu præcidantur, præfixis literis I K, mox assumpto circino ad rem commodè proferendam, pede vno in I infixo subsistente I A interuallo linea circumducatur vsque donec ad alteram extremitatem C perueniat, inuariatoq. circini pede K puncto compari linearum perscriptione circuli semianfractum designet A D E. Hoc peracto puncto F lineæ in plano iacentis perpendicularis extollatur, quæ in cuspide curuaturam C contingat, aio lunulas A B C G, C D E H, æquales esse trimetro A C E. Quoniam circulus A C E duplex est A B C, C D E, ergo semicirculus A B C, C D E æquales sunt semicirculo A C E, amputentur duæ communes portiones A G C, C H E, residua rectilinea triangula A C F, F C E æqualia sunt lunulis ABGC, CDEH vel modo, quo supra præcepimus triangulum dupli A G C F æquale est semicirculo ABC, & triangulum F C H E æquale semicirculo C D E, subductis communibus portionibus AGC, C H E, triangulum A C E, est æquale duobus lunulis A B G C, C D E H.

Consectarium.

Antequam vltra progrediar consentaneum duxi adnotandum angulum rectum A C E bifariam dissectum in C ex (per 8. 6. Euclid.) E C, ad C A rationem habet vt E F ad F A, & sic triangulum C F E ad triangulum C A F (per primum 6. Euclid.) & quia æqualia sunt, lunulæ quoque æquales sunt.

Vacans ſpacium, quod intra figuras omnes notas interuenerit quadrare.

Prop. 3.



RECta linea A B dirigenda eſt, & ab eius vmbilici medio puncto C ſemiorbis circumducendus eſt A E B, completo ſemiorbi A C B, lunula complenda eſt more A E B D, mox laterales lineæ erigendæ ab extremitatibus A B ſunt, & medio eius puncto E ſuperior linea exaretur ipſi A B æquidiſtant, vt vltro, citroq. ſemicirculum tangant, etiam hiſce lateribus parallelogrammum exprimant AGHB, demum ab extremitatibus A B, medio puncto E tranſuerſas lineas ſortiatur A E, E B. Quoniam parallelogrammum GABH ſemicirculum continet, & eſt ſui quadrati dimidium, ſemicirculus lunulam continet AEBD, & lunula AEBD ſuo triangulo AEB æqualis eſt, & triangulum AEB ſui parallelogrammi dimidium eſt, ergo interceptæ areolæ AGE, EHB, ADB, quæ lunulam A B ambiunt, æquales ſunt ipſi lunulæ areolæ; ergo ſui amplexantis parallelogrammi dimidium ſunt.

Conſectarium.

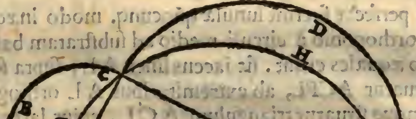
EX hoc perſpicuum eſt lunulam ſui quadrati partem eſſe quartam; nam ſi lunula ſui obſepientis parallelogrammi dimidium eſt, & parallelogrammum ſui quadrati dimi-

dimidium; igitur lunula sui quadrati dimidium erit.

Vel si cuiuscunque figuræ notæ vacua quadrare velimus modo supra cognito nota figura circumclaudatur, quam si à nota subtrahes, optato potieris ex secundo axiomate (secundi nostri) sit gratia exempli pelecis HEIGOF sæpienda suo parallelogrammo ABCD, quam ab ipso seduces, sic inclusæ areæ HAE, EBI, IGOD, OCHF residuum innotescet.

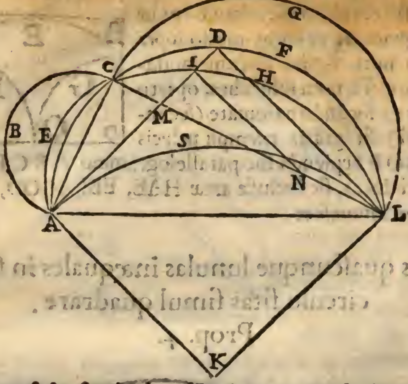
Duas quascunque lunulas inæquales in semicirculo sitas simul quadrare.

Prop. 4.



TRiangulum rectilineum insemicirculari linea definiri debet, quod tribus notis distinximus ACE, supra eius latera semicirculi incubabunt ABC, CDE, quibus congruens area adinuenienda est; inquam angulus A C E in semicirculo rectus est, & bini semicirculi A B C, C D E æquales sunt semicirculo AGCHE ex eis, quæ supra habita sunt, reiectis communibus portionibus AGC, CHE relictæ semilunulæ A B C G, C D E H residuo triangulo ACE rectilineo æquiparantur.

At



At ſi perfectæ fuerint lunulæ quocunq. modo inæquales, ſemper orthogonio à circuli medio ad ſubſtratam baſim deducendo æquales erunt, ſit iacens linea AL, ſupra ſemicirculus ſtruatur ACFL, ab extremitatibus A L orthogonium quodcunque ſtruatur triangulum A C L, cuius laterum ductum rectum angulum in C conſtituant ſupra latera AC,CL, Ambientes ſemicirculi conſurgant ABC, CGL, & in eis perfectæ lunulæ ex more deſignentur A B C E, CGLH. His peractis in verticis ſinuoſæ lineæ puncto D ab diametri extremitatibus A L duo latera conſurgant, vt orthogonium triangulum ADL conſtituant, aio dictas perfectas lunulas ABCE, CGLH, in circulo A C D F L deſcriptum ſemper dicto triangulo ADL æquales eſſe: Quoniam lunulæ A B C E, CGLH æquales ſunt triangulo orthgonio A D L ſemper ex ſecunda huius.

Poteſt & alia probandi ratio ſuſcipi. Triangulo A D L ſuper lineam AL deſcripto aliud triangulum æquale infra lineam AL deſignetur, & ſit ALK, & puncto K circini pede

A fixo,

fixo, altero vago in A collocato sinuosa linea ducatur vsque ad L. Quoniam duæ lunulæ perfectæ ABCE, CGLH æquales sunt vni lunulæ ASL (ex prima huius) & lunula ACDFLS est æqualis triangulo AKL, quod idem est cum triangulo ADL.

Consectarium.

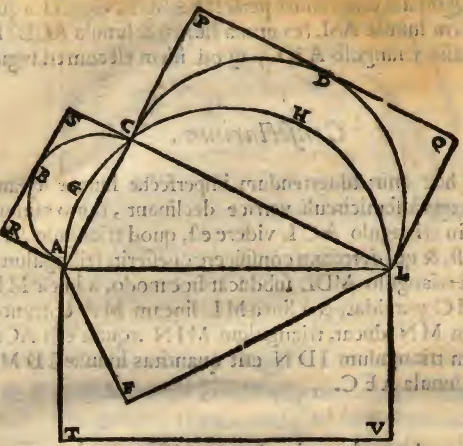
EX hoc animaduertendum imperfectæ lunulæ quanto magis à semicirculi vertice declinant, tanto minores fieri, vt in triangulo ACL videre est, quod triangulo ADL minus est, & qui defectum conspicere quæsierit, triangulum ACM à triangulo MDL subducat hoc modo, à linea MD, linea MC præcidat, & à linea ML lineam MA obtruncet, & lineam MN ducat, triangulum MIN æquale erit ACM, reliquum triangulum IDN erit quantitas lunulæ IDML, dempla lunula AEC.

Vacua inter lunulas intermissa quadrare.

Prop. 5.

AT vero interuenientia vacua circa lunulas si quadrare quæsieris, ita quadrabis. Esto minor lunula ABCG, maior CDLH imperamus semicuruilinea triangula inania inter illas, in rectilineas figuras reddere scilicet CPD, DQL, CHL, ARB, BSC, AGC, circumscribantur parallelogrammata tangentia earum ambientes lineas PQCL, ARSC, & fiat alterum parallelogrammum ex binis AL, TV, & sit ALTV, & fiat triangulum ACL æquale AFL (per 31, primi Euclid.) quibus ita dispositis inquam vacuum circa ATVLF æquale esse imperatis vacuis.

cuis. Quoniam triangulum A F L eſt æquale ACL ex

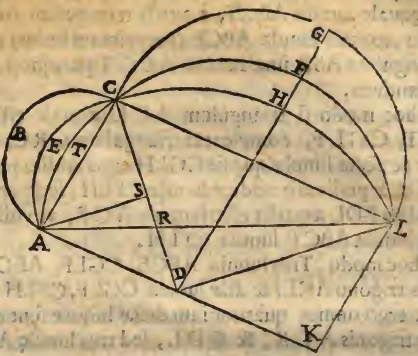


conſtitutione,& triangulum ACL eſt æquale lunulis CDLH, & A B C G, ergo ſi triangulum A F L à parallelogrammo A T L V abſtuleris, reliquum vacuum A T V L F erit æquale interiectis vacuis iam recenſitis.

Duas lunulas inæquales in ſemicirculi ambitu deſcriptas ſeorſum quadrare.

Prop. 61.

ESTO rectangulum triangulum A C L, cuius porrectius latus C L ſit duplum exilioris AC, & circumferantur lunulę ex more, quibus adijce ſuas literas indices C G L F, & A B C T, mox parallelogrammum conſtituatur ex lateribus

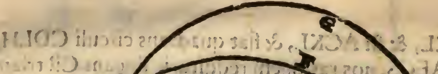


ribus AC, CL, & ſit ACKL, & fiat quadrans circuli CDLH, & ſubdupli AECS, nos rationem redditurí, lineam CR triangulum ACL partiri taliter, vt anguli compares mutuo correſpondentes, & æquales ſint, vt ACR par ſit RDL & triangulum A C R par ſit lunulæ A B C T, & triangulum CRL ipſi CGLF. Quoniam lunulæ CGLF, & ABCT pares ſunt triangulo ACL quarta huius noſtri adiuuante, & triangulo ACL par trimetrum C D L, quoniam vtrique ſui parallelogrammi dimidium eſt (vt figura quarta huius demonſtratum eſt) ergo triangulum C D L eſt duabus præſignatis iam lunulis CGLF, & ABCT æquale, ſed triangulum CDL eſt æquale lunulæ C G L H, ergo lunula CGLH eſt æqualis CGLF, & ABCT ſubducatur ſemilunula CGLF, vtpotè vtrique communis, remanet ſublunula CFLH æqualis ABCT, & quemadmodum triangulum CDL æquale ACL, ſubducatur commune C R L, reliquum triangulum R D L reliquo triangulo ACR æquale, lunularũ partium repręſentantia, ſequitur trian-

gulum RDL eſſe æquale ſublunulæ C F L H, & triangulum ACR æquale lunulæ ABCT, à quo ſi triangulum ACS ſubtrahatur, æquale lunulæ ABCE (per primam huius) remanet ſubtriangulum ASR imæ lunulæ A E C T par, quod erat demonſtrandum.

Vel hoc modo ſi triangulum A C L æquale eſt lunulis A B C T, C G L F, compleatur triangulum C R L, & compleatur perfecta lunula, quę ſit CGLH, ergo addita pars trianguli RDL æqualis erit additæ lunulæ CFLH, ſed pars trianguli addita RDL æqualis eſt triangulo A C R, vt vidimus, & par eſt lunula ABCT lunulæ CFLH.

Vel hoc modo. Tres lunulæ ABCE, CGLF, AECT ſunt æquales trigono ACL, & duæ lunulæ CGLF, CFLH trigono C D L, ergo omnes quatuor iam dictæ lunulæ ſunt æquales duobus trigonis A C R, & C D L, ſed tres lunulę A B C E,

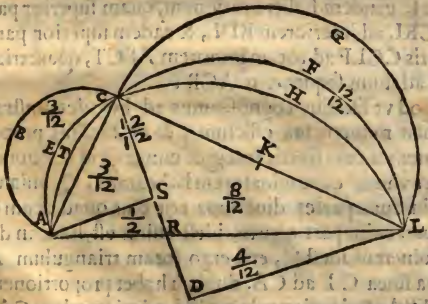


CGLF, LFCH ſunt æquales trigono ALK, ergo reliqua

lunula AECT est æqualis trigono ASR, quod quęrebamus.

Vel tres lunulę ABCE, AECT, CGFL æquales sunt trigono ACL, & trigonum CDL æquale lunulę CGLH, tolle triangulum CDL ęquale iam dictę lunulę CGLH, reliquum triangulum ACR lunulis ABCE, AECT æquale est, tolle lunulam perfectam ABCE sub lunula AECT sub triangulo ASR æqualis erit, quod erat demonstrandum.

Trianguli in circulo descripti angulo per medium discisso, & lunulis à circulo medio diuisis, proportio partis maioris trianguli ad minorem, est sicut superior pars maioris lunulæ ad inferiorem, & superior eadem pars ad minorem lunulam, & superior pars trianguli ad inferiorem sequitur eam suarum lunularum. Prop. 7.

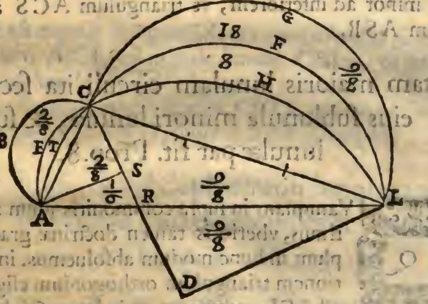


Priusquam ad diuersarum partium rationem lunularum

descendamus, admonitione dignum censemus, quod cum ab æqualitate duarum lunularum descendimus, quam (in secunda parte) vidimus, quantum maior crescit, tantum altera decrescit, & ex alterius defectione altera augumentũ suscipit, & circulus ille, qui per medium vtriusque percurrit, à maiori semicirculo subripit, & minori addit, sed id non temerè, sed certo se superant excessu, vt ratio maioris superioris lunulę ad inferiorem eadem sit, quam maioris superioris trianguli pars ad inferiorem, & ratio maioris superioris lunulę ad totam minorem, vt ratio partis trianguli anterioris ad posteriorem, eandem sequuntur analogiam, & vtraque vtriusq; rationem sequitur, vt exemplis patebit. Triangulum rectangulum strue, cuius angulis appinges literas ACL, productius latus CL in duas partes, angustius in vnam partiri. In puncto bifariæ scissionis lateris CL signa K, ex quo, & interuallo CK circinationis arcus exaretur, cui suas indices literas applicabis CGL, eodemq. ordine signa AC suum arcum delinea ABC, mox triangulum maioris circuli CGL constitues, & sit CDL, & minoris ABCE, sit ACS supra succumbentem omnium basim AL, medius circulus flectatur ACFL, dico lunulam superiorem maioris circuli CGLF ad suam inferiorem CFLH, eandem habere rationem, quam superior pars trianguli CRL ad inferiorem RDL, & eadem superior pars lunulę maioris CGLF ad totam minorem ABCT, quam triangulum CRL ad suum sequentem ACR.

Quod vt facilius cognoscamus ad hoc demonstrandum adhibeo numerorum officium, & vt facilius proportiones obseruemus cum fractis integros numeros in fractiones soluamus, vt vnum denominatorem habeamus. Quoniam lineam CL in duas partes diuisimus erit eius quadratum quatuor partium, cuius pars quarta, idest vnitas est, hanc in duodecimas soluemus, idest $\frac{12}{12}$, erit ergo totum triangulum ACL $\frac{12}{12}$, & quia linea CL ad CA, duplam habet proportionem, ita RL ad RA, & sic triangulum CRL ad triangulum CAR, ergo

triangulum CRL erit $\frac{8}{12}$, & triangulum ACR $\frac{4}{12}$. Ergo tota lunula perfecta CGLH $\frac{12}{12}$ erit ſuperior lunula maioris circuli CGLF cum duabus lunulis ABCT ſimul iunctæ ſunt $\frac{12}{12}$. Triãgulum CDL erat $\frac{12}{12}$, ſi ſuperior pars erat $\frac{8}{12}$ inferior RDL erit $\frac{4}{12}$, & quia tota perfecta lunula CGLH eſt $\frac{12}{12}$, vt proportio quadrupli ſeruetur, quam habet ad minorem perfectam ABCE $\frac{3}{12}$, & triangulum ACS erit ei par $\frac{2}{12}$, inferior ergo pars $\frac{1}{12}$, & cum nullus melior congruat ſublunularum partibus ſit ſublunula AECT $\frac{1}{12}$, ſic ſuperior pars maioris lunulæ $\frac{8}{12}$ inferior $\frac{4}{12}$. Vnde proportio trianguli ſuperioris CRL ad inferiorem BDL, erit dupla, vt ſuperior maioris lunulæ pars CGLH ad inferiorem etiam dupla, ideſt $\frac{8}{12}$ ad $\frac{4}{12}$, & proportio ſuperioris lunulæ pars CGLF ad lunulas ABCT etiam dupla eſt, ſed ſuperior minor lunula ad inferiorem tripla eſt, vt $\frac{3}{12}$ ad $\frac{1}{12}$, ſic triangulum ſuperius ACS ad ASR, vt $\frac{2}{12}$ ad $\frac{1}{12}$.



Subijciatur aliud exemplum in tripla diuiſione ſupra lineam porrectam AL, circulum effingamus ACFL, mox in eo triangulum deſcribendum, vt rectus angulus C literam poſſideat, cuius latus vnum longius CL tres partes, minus AC, vnam ſortiatur in ſtruendis ibi commodè ſemicirculis CGL

maior,

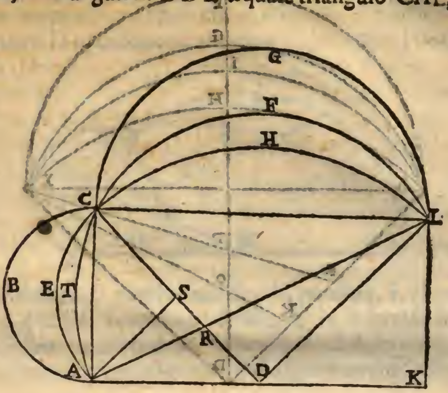
maior, ABC minor. Inde perfectæ lunulæ ex ordine subsignentur, idest trianguli CDL, CGLH, trianguli ACS, ABCE.

Triangulum ACL, quia linea est trium partium, area erit $\frac{12}{8}$, proportio CRL ad ACR est tripla, ob id triangulum CRL erit $\frac{9}{8}$, & triangulum ACR $\frac{3}{8}$, triangulum CDE latus trium est partium, quadrans est nouem partium, cuius quarta pars est $2\frac{1}{4}$, idest $\frac{18}{8}$ supra sunt trianguli CRL $\frac{9}{8}$, ergo triangulum RDL erit $\frac{9}{8}$; tres lunulæ ABCE, AECT, CGLF est $\frac{12}{8}$ superior maior ad duas minores est tripla, ergo lunula superior est $\frac{9}{8}$, & duæ lunulæ ABCE, AECT est $\frac{3}{8}$, sed lunula perfecta est $\frac{3}{8}$, ergo superius triangulum CAS $\frac{2}{8}$ subditum reliquerit $\frac{1}{8}$ & sublunula reliqua $\frac{2}{8}$ inferior maior lunula, vt compleat numerum $\frac{12}{8}$ erit $\frac{9}{8}$, ergo proportio lunula superior ad inferiorem, idest CGLF ad CFLH sicut triangulum CRL ad RLD, & lunula EGLF ad lunulas ABCT, & superior lunula minor ad inferiorem, vt triangulum ACS ad triangulum ASR.

Datam maioris lunulam circuli ita secare, vt eius sublunula minori lunulæ, & sublunulæ par sit. Prop. 8.

QVamquam in supra commonitis idem indicauerimus, vberioris tamen doctrinæ gratia exemplum in hunc modum absoluemus. in hanc rationem triangulum orthogonium eligendum est ACL, cuius porrectius latus CL bifariam dispescemus, supra lunulas ex more constituemus, & medium circulum ATCFL, & eis triangula subijciemus CDL, ACR, mox datis lineis AC, GL parallelogrammum constituatur CALK, inquam sublunulam CFLH, lunulis ABCT æqualem esse. Quoniam lunula CGLH æqualis est suo triangu-

lo CDL, & triangulum CDL, æquale triangulo CAL, quia



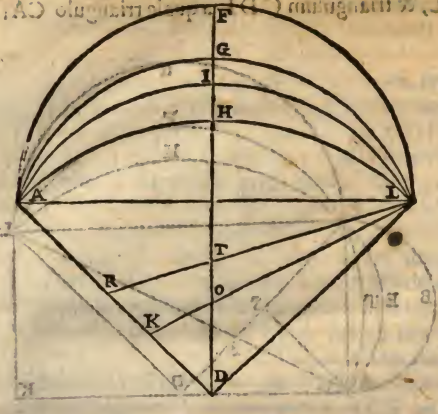
vtrumque est æquale suo parallelogrammo dimidio CALK, & triangulum ACL est æquale lunulæ CGLF, & lunulis ABCT, ergo lunula CFLH est æqualis lunulis ABCE, & AECT, tollatur de medio lunula CGLF, remanebit sublunula CFLH æqualis ABCT, quod erat discutiendum.

Datam dupli, & subdupli circuli lunulam ad imperatas partes discindere.

Prop. 9.

ESto dupli, & subdupli multifariam scindenda lunula AFLH, cuius subtensa AL, sui compar triangulum inferius substituemus ADL à medio inflexi circuli vertice F usq; ad trianguli aciem infernè positam D, recto ductu descendat. In dextro trianguli latere AD futuræ lineæ designandæ sunt lu-

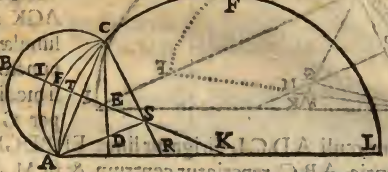
nulam



nulam diuisuræ in quotcunque partes volueris decem, vel septemdecim, pro nunc bifariam in R dispescito, & transuersam ad L deducito, si velis lunulæ mediam partem auferre, & vbi se lineæ cum diametri linea decussabunt, fige circini pedem fixum, & vagum alterum ad alterutrius diametri extremitatem A, vel L, arcum circumflecte A G L, nam lunula AFLG erit dimidium lunulæ. Vel si tertiam partem vis auferre, sit latera K in laterali tractu tertia pars ab K ad L lineam porrigito, & vbi FD lineam secat, pede circini stabili collocato, ac vago altero ad A extremum, arcum circumduces A I L, & tertiam lunulæ partem A I LH à duobus abscindet. Quoniam triangulum ADL per RL lineam bifariam dissectum est, superior trianguli pars ARL per superexaratam propositionem superiori lunulæ parti AFLG congruit, & ima trianguli pars RDL imæ lunulæ parti correspondet, & vtræq. partes sunt, ergo & lunulæ eis pares dissectæ sunt: Idem de tertia parte dicendum.

Eadem

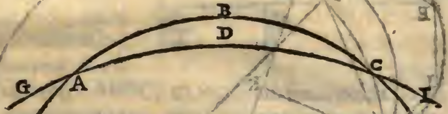
Eadem in parua lunula operaberis, nam si bifariam ABC lunulam vis partiri trianguli eius ABS latus, AS bifariam in D, & latus à D quousque ad punctum C perueniat protrahe-



mus, & lineam à B medio semicirculi, punctoq. S, vsque ad circuli A T C F L centrum perueniat, & vbi se intersecabunt puncto E siste circini pedem, & Interuallo EA, extende circulū AIC, & diuisa erit lunula: probatio ex anteriori liquet.

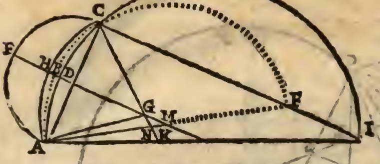
Datam quamcumque lunulam quadrare. Prop. 16.

ESto exposita quadranda lunula A B C D cuiuscunque ordinis, cui æquale oportet reperiri rectilineū, maior cir-



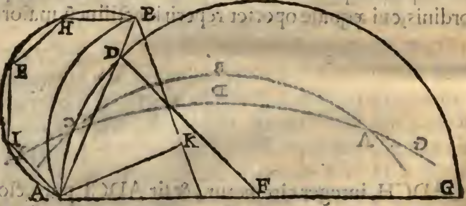
culus GADCH, integer circinetur, & sit ADCI porrecto suo diametro AI, & à puncto A superponatur præfata lunula ABC, & compleatur circulus A B C F cum suo diametro AF, extendaturq. linea à puncto A ad C, & sit AC, discindaturq. rectus angulus ACI per rectam C K, & super basim AC circinetur semicirculus AEC, & puncto G, basi AC, fiat quadrans

dupli, & sit AHCG, & trahatur A G, G C. Quoniam triangulum A C G est æquale lunulæ ACEH, remanet subtriangulnm AGK æquale sub lunulæ AHCD. à puncto semicirculi medio E, AEC per G, vsque ad



centrum circuli A D C I, dirigatur linea EHBDGML ex circumferentia A B C reperiatur centrum, & sit M, & trahatur A M, vsque ad F diametri finem ex supradictis, si à triangnlo AGK, quod lunulam AHCD refert, subducatur AGM, quod repręsentat lunulam A H C B, remanet subtriangulum ANK repręsentans sublunulam ABCD, quod erat edocendum.

Semilunulas ex nota ratione quadrare. Prop. 11.



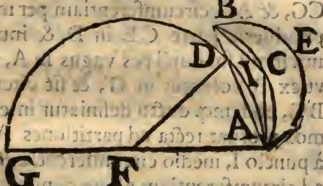
IN sola proportione dupli, & subdupli accidit, vt semidiameter circuli subdupli sit æqualis subtensæ quadrantis dupli, vt in prima Prop. huius vidimus: ideo in his perfectæ lunulæ, & alijs potius circuli semilunulæ dici possunt.

Esto

Eſto circulus ADG quadrans ſemicirculi AEB, & quarta pars ſemicirculi A D G ſit A D F, & diameter ſubdupli ADB tranſeat per punctum D, dico triquetrum A D F ſemicirculo AEDB æquale eſſe. Tollatur communis portio DA, remanet lunula AEBD, æqualis triangulo FDA, ſed AEBL perfecta lunula nota eſt: ergo ſublunula A L B D nota erit, ſubducito triangulum D B K ab A K F, reſiduum ſublunulæ A L D B notum erit.

Poteſt & alio modo cognoſci. Portio quadrupli AD valet quatuor portiones ſubquadrupli, ſecetur circumferentia AEB quadrifariam, & ſint portiones AI, IE, EH, HB, amputentur portiones AI, IE, EH, HB, reponatur AB, trapezium rectilineum AIEHBD notum erit, & ſic de cæteris.

Alio modo.

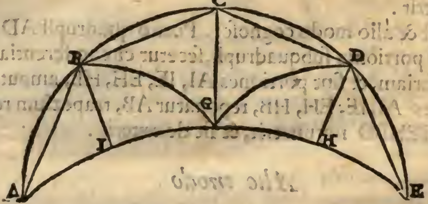


SIt ſemicirculus A D G, quadruplus ipſius A E B, & ipſius AEB, capiatur duplus, & ſit circumferentia ACB, remaneat infra ſublunula A C B D I A, quam volumus quadrare. Quia ſemilunula ACBDIA, nota eſt, & nota etiam lunula AEBC, ex vigeſima ſexta primi noſtri, ſi notum à noto ſubtrahatur, quod reliquum eſt notum erit.

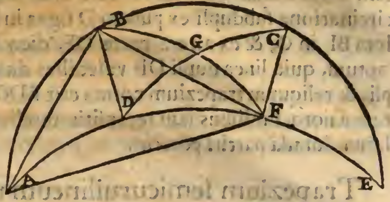
Poſſumus etiam proximè prædicto modo quadrare, quia portio A D, eſt dupla ipſius A C B, diuidatur A C B, in duas partes AC, CB, demantur hæ duæ portiones AC, CB, reponatur A D, rectilineum A C B D A, eſt æqualæ ſublunulæ A C B D I A.

Lunulam per latum in quadrabiles partes diuidere. Prop. 12.

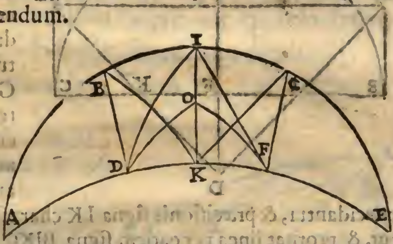
NNunc me conuertam ad quadrandas lunularum in latum partes, cum paulò ante per longum indicaueri-



mus. Esto lunula AECG, diuidaturq. per medium per lineam CG, & AC circumferentiam per medium proscindes in B, & ex aduersa parte CE in D, & inuariata circini apertura semicirculi subdupli pes vagus in A, alter fixus sistatur taliter, vt ex B voluatur in G, & sit circumferentiæ circumductio BG, eodemq. ductu definiatur intercapedo GD similis BG, mox proruat recta ad partitiones AB, BC, CD, AG, GE, & à puncto I, medio circumferentiæ AG, erige lineam sursum ad circumferentiam vsque donec eam in B tetigerit. Quoniam AB est æqualis BG, & portio AG dupli rependit duas AB, BG semidupli, dico illis AB, BG sublatis, hac AG reposita, rectilineum triangulum ABG notum erit, idem intelligendum de altera partitione GDE, reliquum triangulum BCDG notum erit, vt residuum notæ lunulæ. Vel amputatis portionibus BC, CD, repositis his BG, GD æquales, & eiusdem circumferentiæ, receensitum triangulum notum erit. Ex his triangula ABG, BCDG, GDE per medium transuersis diuisa lineis nota erunt, & tripartita erit lunula.



Vel circuli dupli tripartita partitione curuaturā conſtituas A D, DF, FE; Item ſubdupli AB, BC, CE; inuariataq. circini apertura intra duo puncta B F, DC mutuo inter ſe intercidentes arcus flectantur BF, DC, & vbi futurus eſt cōtactus illic pone G, aio triangulum ABF notum eſſe; quia AF, dupli circumferentia, duobus illis ſubdupli AB, BF reſpondet; vnde reiectis illis, hac repoſita portione penſatur. Idem de alia parte DCE dicendum, & triangula BGD, CGF, BGC, DGF nota ſunt, ſic etiam triangulum BCE, & FCE dicendum.



Remanente adhuc lunulę illæſa tripartitione ex puncto D fixo circini pede altero ad F ſigna in ſubduplo æqualē portionē in I, mox inuariata circini apertura, qua duplū circulū conſtituiſti, ſiſte circini pedem in altera extremitate lunulæ puta E, alterum ad D, & I conuerte, & ſigna circumferentiam dupli DI, & ab I ad F excurrat recta I F, dico triangulum DIF notum, quia circumferentia dupli DF eſt æqualis DI ex conſtitutione, ratione iam ſæpius repetita, addendo, & demendo notum erit triangulum DIF, vel intercapedine BK circinetur BK circumferentia dupli, & recta ducatur K C, quia D F eſt compar BC, & DF æqualis ipſi BK, tolle portionem BC, repone BK triangu-

lum

lum BKC notum erit, vel deducta linea IK, & interuallo B I circinatione ſubdupli ex puncto D ſigna in linea I K interuallum BI in O, & ex altera parte OF, dico triangulum DOF notum, quia linea dupli DF valet illas duas DO, OF ſubdupli, & reliquum trapezium notum erit BDOFC demendo notum à noto, ſimilibus iam recenſitis modis multipliciter perlatum lunula partiri poterit.

Trapezium ſemicuruilineum trapezio par extruere. Prop. 13.

Esto dupli quadrans DGLH, & hinc inde à terminis G H tranſuerſa linea ducenda eſt, quæ curuaturam ſpectet, & ſit G H, mox duo latera, quæ anguli faciem in D confirmant DG, DH, amuſſim in medio præcidantur, & præciſionis ſigna I K characteribus inſigniantur, & proruat linea per eadem ſigna BIKC ipſi GH parallela, & ex punctis G H ad perpendiculum demittantur ſupra B C lineæ G B, G H, & excurrentes in longum lineam BIKC bifariam diuidat, cuius diuiſionis terminus F, & centro F interuallo F B, circumducatur ſemicirculi forma ſubdupli B A C, quæ quadrantis circumferentiam in duobus punctis intercidet: Interciſionis puncta totidem literas ſortiantur M, N, & vniatur F D. Dico Trapezium ſemicuruilineum BGMLNHC par eſſe quadranti DGLH, ſed ad demonſtrationem accingamur. Quoniam F D æquidiſtat H C, cadit

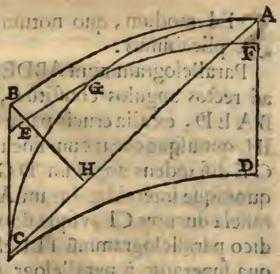
inter

inter eas D H, ergo anguli F D K, K B C æquales anguli ad K contrapositi etiam pares. Itidem & recti ad F C, & H K linea ipsi KD etiam æqualis. Triangulum ergo FDK triangulo K H C compar. Idem ex contraria parte sentiendum, cum compari linearum descriptione confirmata sit. Demantur ergo triangula IFD, FDK reponantur GBI, KHC, trapezium semicuruilineum B G M L N H C æquipollet semicirculo B M A N C.

Consectarium.

EX his apparet lunulam MANL æqualem esse duobus triangulis MGB, NHC, quoniam circuli pars extramittitur MANL, includantur trapezij partes NHC, MGH.

Triangulum semicuruilieum ex quarta semicirculi subdupli, & octaua dupli quadrare. Prop. 14.



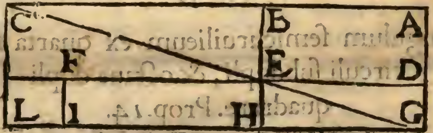
SIt semiabscissa lunula AGCD, & linea CB ipsi AD parallela constituatur, & dupli circumferentia A B extremitate A ipsi CD parallela ducatur, donec ductum lineæ CB contingat in B, dico semicuruilineum triangulum ABCG quadrari posse. Quoniam AB ipsi CD Parallela, & eiusdem circumferētiæ, ergo quadrangulum BACD notum est, à quo si semilunula subducatur CGAD, remanet triangulum notum ABCG.

Vel

Vel quia lunula æqualis eſt AGF ipſi ECG ex præcedenti, parallelogrammum EBAF eſt notum, quia ex æqualibus circumferentijs; ergo & triangulum CBA notum eſt, quia vtrique additur commune GAF.

Vel triangulum ſemicuruilineum, quod paulò ante deſcripſimus ABCE remaneat, & ducatur linea CA portio ſemidupli CGA, & ſit ABH ſemiportio dupli, ergo æquales, abſceſſus communis EHGA tollatur, remanet BEA æquale CEH; addatur vtrique communis B E C, ergo triangulum rectilineum BHC eſt æquale triangulo ſemicuruilineo BCGA.

Notum à noto ſubtrahere. Prop. 15.

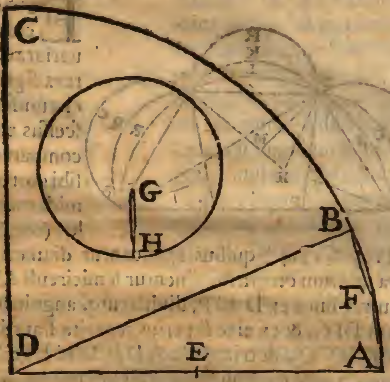


SEd modum, quo notum à noto ſubtrahatur nunc explicabimus.

Parallelogrammum ABDE circa decuſſatas lineas BH, EF ad rectos angulos conſtitue, & ſit quantitas lunulæ datæ B A E D, ex alia crucis parte H I E F, elongeturq. parallela IH, quouſque coeat cum linea AD in puncto G, mox linea G E diſcindens angulum D G H, ducatur per coniunctum E, quouſque intercidat lineam AB, & ibi appone C, & ab C, parallela ducatur CL, vſque donec lineam GHI tetigerit in L, dico parallelogrammũ FLI eſſe quantitatem trianguli BAC, qua ſuperatur à parallelogrammo FH; quoniam parallelogrammum BD eſt æquale parallelogrammo EL, dempto parallelogrammo FH, reſiduum erit FL, quod quærimus.

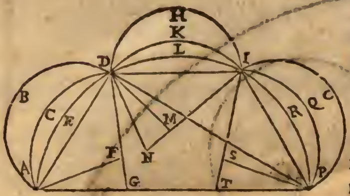
Circu-

Circulum quadrato proximum conſtituere.
Prop. 16.



ABſoluta lunularum tractatione venio tandem ad circuli quadrationem ex ingenij facultate, ſed initio circuli quadrationi approximabimur. Eſto ſexto decupli circuli quadrans A B C, & ex ſemidiametri dimidio D E, ſub ſexto decuplus circulus conſtituatur GH,amputetur pars quadrantis ADC, ſitq. DBA, dico triangulum DBA circulo mutua parilitate conſtare ſecetur arcus quadrantis BA bifariam in F, connectanturq. rectè BF, FA, & à circulo G H itidem duæ illæ portiones quadrantis BF, FA, dico triangula FDB, ADF eſſe æqualia circulo, demptis duobus portionibus GH, æquales illis BF, FA intercluſis : quod patet ex conſtructione.

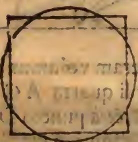
Datum circulum quadrare. Prop. 17.



ESto expositus circulus A D I P, inuariataq. circini apertura signetur in circuli circumferentia tres abscessus tres. n. recipiet compares,& coæquales sibi correspondentes semidiametro semicirculos (cogēte ad id Euclidis Propos. 15.4.) quibus applicentur diametri AD, DI, IP, supra quorum centra incuruentur semicirculi ABD,DHI,IOP, excurrat linea ex D ad P, diuidaturq. angulus A D P per lineam DFG, & ex arte superius repetita fiant lunulæ ABDC, DHIK, IOPQ, & triangula A D F, D M I, I S P cum suis sub triangulis suis sublunulis correspondentibus A F G, D N M, P S T.

Quoniam semicirculus A L P constat quatuor semicirculis æqualibus semidiametro, si tollantur tres portiones communes A E D, D L I, I R P, & tria triangula æqualia lunulis AFD, DMI, ISP, tollanturq. tres sublunulæ tribus subtriangulis respondentes ACDE, DKIL, IQPR, cum suis subtriangulis respondentibus illis AFG, NDM, SPT, vacuum reliquum intercedens rectilineum, vel trapezium G D N M I S T valet quantum semicirculus quartus relictus X Y Z, hoc inane valet semicirculus X Y Z. Absoluamus igitur circulum cum suo quadrato valente trapezium illud, & quadratus erit circulus.

Nunc



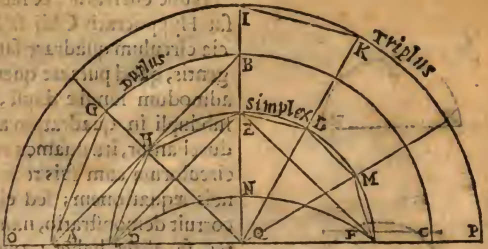
Nunc euertatur, & faceſſat Hyppocratis Chij fallacia circulum quadrare satagentis, quod putarat quemadmodum lunulæ dupli, & ſubdupli in quadratum adducebantur, ita quamcumq. circulorum cum ſuis rectilineis æquationem; ſed eius corruit demonſtratio, nam res ſe aliter habet: quod enim eſt ſingulare in circulis ſe in dupla proportione excreſcentibus, diſſentaneum eſt idem in reliquis exiſtimare. Nos (ni fallimur) ex inuentione trianguli A F C ſublunulæ aereæ A D C E reſpondentis, aſſecuti ſumus.

Data portione nota, alteram cuiuſq. proportionis ſibi comparem peruestigare.

Prop. 18.

ESto linea O P futura baſis variorum circulorum, & ſemicirculus O I P triplus, A B C duplus, & D E F ſimplex, ſiue ſubduplus, & ſic de alijs alter ſuprà alterum in quæſita ratione ſemper excreſcens, & à puncto Q, quod medium diametri poſſidet angulis vtrinque æqualibus aſcendat linea Q I ſemicirculus bifaria diuiſione diſcendens: mox ex centro Q circumferentiam AB æqualiter partiens vſque ad C, tranſmittatur, ex altera parte duæ aliæ circumferentiã I P, trifariam ſecantes coæquentur, & ſint Q K, Q M, & ſit

 data



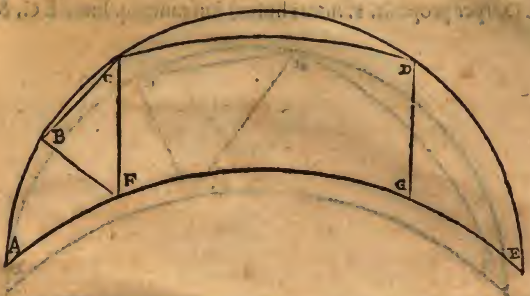
data simplicis circuli portio DE, alteram volumus in dupla proportione æqualem inuenire. Dupli quarta A G B discindatur bifariam, trahaturq. linea AG, & à puncto D ad E dupli portio subpingatur. Quoniam vidimus in lunula DEFN, portionem dupli quartæ circuli DNF valere duas quartas circuli subdupli, vel simplicis D H E, E L F, sed portio dupli DNF est æqualis A G B, quia eadem est dupli quarta. Ergo area conclusa in portione dupli DNF valet duas quartas subdupli DHE,ELF, & portio octaua dupli AG valet duas octauas subdupli D H, H E. Idem dicendum de tripla; nam circulus O I K P est triplus subtripli, vel simplicis circuli DHELF, & par sexta semicirculi tripli I K, valet tres sextas subtripli circuli EL, LM, MF, & sic de alijs cuiuscunque quantitatis, & incognitæ mensuræ dicendum: nam semper rata, & iusta proportio erit.

Ex portionibus circulum quadrare. Prop. 19.

EX ea, quam modo exposuimus propositione dependet hæc portionum quadratio, quam ob oculos exponemus.

Esto proposita lunula A B C D E, ex qua (docente id 15. propos. nostri ante præteritam) minor lunula abscindatur,

quæ



quæ ſit CD, ab cuius extremitatum terminis infernè deſcendant perpendiculares CF, DG. Quoniam quadrangulum ſemicuruilineum C F D G notum eſt ex eiſdem æqualibus circumferentijs dupli CD, GF, nota quoque eſt minor lunula CD; ſi à lunula ACDE ſubducatur quadrangulum notum CDGF, & lunula CD reſidua cornicula ACF, DGE nota erunt. Mox lineæ dupli AF ſubdupli compar AB reperiatur (per propoſitionem proximè præteritam) & erit trilaterum BFC, quod ſubtrahes à corniculo ABCF, & erit triangulum B C F notum. Duc lineam B C, & trilaterum rectilineum B C F notum ſubtrahe à ſemicuruilineo B C D noto, & area intra portionem BC concepta nota reſultabit.

Altera.

ALiam figuram extruendam non putamus, ſed ſuperiore lunula relicta. Eſto à puncto A vſque ad B duo puncta, dupli circumferentia flectatur, & ſit lunula minor AB, & æqualis A B, fiat linea A E dupli, & à puncto B ad E rectus

tra-

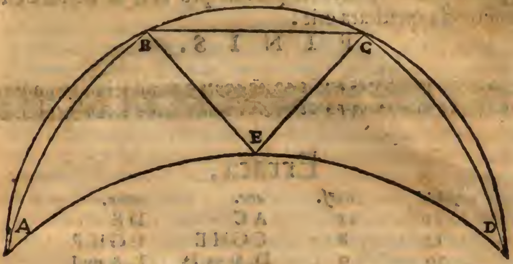
trames ducatur. mox lineæ ED compar ſubdupli reperiatur CD, (per propoſit. 2. noſtri huius) iunganturq. lineæ E C, &

B C, recta lineam etiam connectatur. Quoniam A B, A E æquales, & eædem circumferentiæ ſunt, ſi lineæ ſubtendantur arcubus A B, A E amputata portione A B, repoſita ſuo loco A E notum erit triangulum ſemicuruilineum ABE, lunula AB nota eſt (ex propoſ. 15. præſentis noſtri) ergo lunulæ pars A B E nota erit, deme A B integram, innoteſcet reſiduum BCDE lineæ ED comparem reddidimus CD. Ergo corniculus ECD notus erit, deme à toto reſiduo BCDE innoteſcet trimetrum ſemicuruilineum BEC, appinge lineam BC à terminis BC, & triangulum rectilineum B C E notum erit, ſubducito à curuilineo, & portio BC nota erit.

Altera.

VEl in lunula ABCDE à puncto A vſque ad E, nota in ſubduplo, & ſit AB, & ex altera parte CD, & à puncto A, vſque ad B appinge lineam dupli AB, & ex altera parte CD, mox connecte lineas rectas B E, E C, B C, quia A B, A E æquales ſunt, ſic C D, D E, ergo lunulæ A B, C D etiam notæ, tolle, quia remanet par medij BEC nota, à noto

to femicuruilineo BCE, tolle rectilineum BCE, remanet no-



ta portio BC, fic & aliæ diuifiones imaginari poffunt, & portiones quadrari.

Data vna portione nota, totam circumferentiam circuli quadrare.

Prop. 20.

SIt propofitus circulus ABCDEFGH, & fit portio nota AB, nos hanc circumferentiam metiemur feptics AB, BC, CD, DE, EF, FG, GH, fupererit HA, qua metiemur bis AB ideft AI, IK, & fupererit KB, quæ portionem IK ter menfurabit. Ergo AB feptics partiemur, quibus abfciffionibus fuas partes addemmus. A portione igitur AB fubducemus octogonum

num rectilineum, reliquum in ſeptem portiones diuidemus, ex quibus portiones tres recipiemus pro HI, & ſic tota circumferentia quadrata erit.

FINIS.

Errata.

pag.	verſ.	err.	corr.
11	21	A C	D E
13	8	C G H E	C G H F
20	9	D, & ex D	L, & ex L
23	1	vtrunque	vtcunque
23	18	A F G	A F C
23	21	F G	F B
30	1	AD	A B
32	5	hit	hic
48	15	Prop 8.	Prop 7.
49	17	repeſitiſq.	repoſitiſq.
58	7	M N.E	M N P
64	20	trapeſium	trapezium
65	8	dupl s	duplicis
68	15	æquidiſtant	æquidiſtans
69	1	dimidium	quarta pars.
70	12	deſcriptum	deſcriptas.
71	15	dempla	dempta
87	13	Semicuruilieum	Semicuruilineum

ROMAE,
Apud Bartholomæum Zannettum. M. DC. X.

SVPERIORVM PERMISSV.

Bartholomæus Zannettus amico Lectori.

IOannis Baptistæ Portæ Lyncæi, Neapolitani V. Cl. ingenium Babylonicis palmis consimile semper existimaui, ex illis enim mella conficere, cibos parare, vina colligere, contexere vestes, & sexcenta alia ad vitam vel sustinendam, vel ornandam sibi comparare dicuntur Assyrij. En tibi, amice Lector fæcundum ingenium Portæ infinita, vel ornamenta, vel adiumenta parturijt, ac elaborauit. Ad excolendum animum philosophicas disputationes, ac mathematicas lucubrationes; ad recreandum reficiendumq. Villam, Pomarium, & lepidissimas Comedias. Ad exornandum Admiranda, & alia multiplicis eruditionis volumina. Vno verbo nihil est in naturæ maiestate repositum, Nihil in huius vniuersi luce versatur, quod tibi Porta non suppeditet. Plerisque iam olim frui contigit, multa propediem expecta, quæ nobis omni disciplinarum genere excultus, ac dignus longiore fælicioreq. æuo Comes Anastasius de Filijs Lyncæus, & Portæ ipsi, quo cum plurima de litteris contulit collega pernecessarius, amantissime impertiuit. Optandum intereà est. vt Porta diutius sibi, tibi, Reipublicæ viuat. Vt autem vno oculorum aspectu omnes magni viri lucubrationes agnoscas illorum Catalogum exponere visum est.

In lucem iam editæ.

Physiognomonia Humana tum Latina, tum Italica lingua libri sex, in quibus docetur, quomodo animi propensiones naturalibus signis dignosci naturalibusq. remedijs compesci possint.

Physiognomoniæ Cœlestis, libri sex, vnde quis facile, ex humani vultus extima inspectione poterit ex coniectura futura præsagire, spretis, ac reiectis Astrologorum inanibus iudicijs, Lat.

Phytognomonica, libri octo, in quibus, noua facillimaq. affertur methodus, qua plantarum animalium metallorum rerum, deniq. omnium ex prima extima faciei inspectione quiuis abditas vires assequatur, infinitis prope modum selectioribus secretis confirmantibus, Lat.

Magia naturalis Lat. & Ital. primum quatuor libris, demum viginti absoluta, in quibus scientiarum naturalium diuitiæ & delitiæ demonstrantur. In primo agitur, de mirabilium rerum causis. Secundo, de varijs animalibus gignendis. Tertio, de nouis plantis producendis. Quarto, de augenda supellectili. Quinto, de metallorum

tallorum transmutatione . Sexto, de gemmarum adulterijs . Septimo, de miraculis Magnetis . Octauo, de portentosis medelis . Nono, de mulierum cosmetice . Decimo, de extrahendis rerum essentijs . Vndecimo, de Myropœia . Duodecimo, de incendiarijs ignibus . Decimotertio , de raris ferri temperaturis . Quartodecimo , de miro conuiuiorum apparatu . Decimoquinto, de capiendis manuferis . Decimosexto , de inuisibilibus litterarum notis . Decimoseptimo, de catoptricis imaginibus. Decimooctauo, de staticis experimentis . Decimonono, de Pneumaticis . Vigesimo, Chaos .

De Furtiuis litterarum notis vulgus de ziferis, libri quatuor , primum euulgati mox alio superaucti, scatent innumeris occulte scribendi modis ijsq. pulcherimis atque vtilissimis, eaq. insuper omnia exponunt atque examinant , quæ à veteribus & nuperis ea de re tradita sunt .

Villa Lat. Pomarium, & Oliuetum olim seorsim, demum vno volumine , libris duodecim comprehensa . Primo, Domus . Secundo , Sylua cadua . Tertio, Sylua Glandaria . Quarto, Cultus & insitio . Quinto, Pomarium . Sexto, Oliuetum . Septimo , Vinea . Octauo, Arbustum . Nono, Hortus Coronarius. Decimo, Hortus Olitorius . Vndecimo , Seges . Duodecimo , Pratum . In quibus maiori ex parte cum verus plantarum cultus , certaq. insitionis ars , & prioribus sæculis non visos producendi fructus via monstrantur, tum ad frugum, vini , ac fructuum multiplicationem experimenta prope modum infinita exhibentur .

De Refractione optices , libri nouem , Lat. Primus, de refractione & eius accidentibus . Secundus, de Pilæ crystallinæ Refractione . Tertius, de Oculorum partium Anatome, & earum munijs. Quartus , de visione . Quintus , de visionis accidentibus . Sextus, Cur binis oculis rem vnam cernamus . Septimus, de his quæ intra oculum fiunt , & foris existimantur . Octauus , de Speculis . Nonus , de coloribus ex refractione , scilicet de Iride , Lacteo circulo , &c.

De Curuilineis, libri duo primum, cui additus tertius, Lat. In quibus altera Geometriæ parte restituta agitur de Circuli Quadratura .

Interpretatio primi Almagesti cum Comm. Theonis, Lat.

De Munitione, libri tres, Lat. quibus Arcium, Castellorum, Ciuitatum munimina plene , ac Methodice traduntur .

Pneumaticorum , libri tres , Lat. Italicè Spiritali : cioè d'inalzar acque per forza d'aria .

De Transmutationibus aeris, libri quatuor, Lat. In quo opere diligenter

ter pertractatur de ijs, quæ vel ex aere, vel in aere oriuntur μετεωρολόγων multiplices opiniones, quæ illustrantur, quæ refelluntur demum variarum causæ mutationum aperiuntur.

De Distillatione, libri nouem, Lat. Quibus certa methodo multiplicique artificio penitioribus naturæ arcanis detectis, cuiuslibet mixti in propria elementa resolutio perfecte docetur. Primus, primordia pandit distillationis, eiusq. causas, & instrumenta. Secundus, Odoratas elicit aquas. Tertius, Olea distillat. Quartus, è Plantis exoticis olea trahit. Quintus, Resinas distillat. Sextus, Oleum e lignis educit. Septimus, Validas extrahit aquas. Octauus, Rerum virtutes & spiritus extrahit. Nonus, Olea exprimit.

Ars Reminiscendi, Lat. & Ital.

Nondum editæ.

Catoptrica, in qua admirabilis speculorum ars plenissime exponitur, & ipsius plurima delitescentia recluduntur arcana.

Theologumena, siue de numeris, mirisq. eorum mysterijs.

Taumatologia, opus selectioribus admirandis experimentis, atque arcanis refertum.

Scientiarum omnium Synopsis.

Comedie stampate.

La Fantesca.
L'Olimpia.
La Cintia.
La Turca.
La Furiosa.
L'Astrologo.
I due Fratelli riuali.
La Sorella.
Il Moro.
La Trappolaria.
La Carbonaria.
La Chiappinaria.
La Penelope Tragicomedia.
Il Georgio Tragedia.

Da stamparsi.

Arte da comporre Comedie.
Plauto tradotto in lingua Italiana.

Tragedie.

Santa Dorotea.
Santa Eugenia.

Come-

Comedie.

I Fratelli Simili. *La Strega.*
La Notte. *L'Alchimista.*
Il Fallito. *La Bufalaria.*

Cinque Comedie d'una fauola sola con le medesime Persone, e la prima è argomento di se, & di tutte; la seconda è protesi di se & di tutte; la quinta è la Catastrofe per se, e tutte insieme.

Due Comedie d'una medesima fauola che l'una si recita in Villa, e l'altra nella Città; e l'una è intermedio dell'altra, mutandosi ogn'atto faccia.

Ab amicis eiusdem Doctissimi Portæ monitus, & illud subijcio habere ipsum præ manibus, de Lyncæo Telescopio opusculum. Quod præclarum hoc Perspicillum, iam pridem ante triginta annos, ab ipso inuentum in prænumeratis operibus, non vno in loco pateat, indeq. ab eo plurimi vberiorem eius doctrinam efflagitauerint. Vale Romæ Kal. Septembris M D C X I.

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